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CONTENTS

PAGE

Professor C. B. Fawcett: AREAS OF CONCENTRATION OF POPULATION IN THE ENGLISH-SPEAKING COUNTRIES 4

Stefan Szulc (Professor of Statistics, Independent University of Warsaw): THE POLISH INSTITUTE FOR THE SCIENTIFIC INVESTIGATION OF POPULATION PROBLEMS 14

Professor Lindsay T. Ride (Professor of Physiology, The University, Hong-Kong): THE PROBLEM OF DEPOPULATION, WITH SPECIAL REFERENCE TO BRITISH NORTH BORNEO 36

Paul Simon: INDICES DE DENSITÉ ÉCONOMIQUE DE POPULATION. MÉTHODE DE CALCUL ET APPLICATIONS 49

Olive Lodge: SOCIO-BIOLOGICAL STUDIES IN THE BALKANS 55

Roswell S. Britton, B.Lit., Ph.D.: CENSUS IN ANCIENT CHINA 83

Harold F. Dorn: THE EFFECT OF RURAL-URBAN MIGRATION UPON DEATH-RATES 95

Professor Dr. P. Mombert: VOLKSWACHSTUM UND WIRTSCHAFT IN IHREN ALLGEMEINEN ZUSAMMENHÄNGEN 115

REVIEWS AND SHORT NOTICES 125

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THE DEATH OF THE KING OF THE BELGIANS

On February 8, 1934, His Majesty King Albert I had given an audience to the Executive Committee of the Association Belge pour l'Étude Scientifique des Problèmes de la Population, who had wished to present Him personally with a copy of the volume which had just been published on *Living Conditions of Large Families in Belgium.* His Majesty had a long and friendly talk with the members of the committee, during which He displayed great interest in the matters of population.

This audience is one of the last granted by the great King, for He met with a tragic death at the end of the following week.

PROFESSOR LÉON BERNARD

It is with deep regret that we record the death of Professor Bernard, who was Vice-President of the Union and President of the French National Committee.

AREAS OF CONCENTRATION OF POPULATION IN THE ENGLISH-SPEAKING COUNTRIES

By Professor C. B. FAWCETT

(*Read at the International Congress of Anthropological and Ethnological Sciences, London,* 1934.)

INTRODUCTION

In dealing with this topic I propose first to give a very brief description of each of the areas dealt with, in respect to its position and extent, and the degree to which the population of the country of which it is a part is concentrated there. Then I propose to note some points of comparison between these areas, and, finally, to indicate some of the trends of movement in the populations concerned which are made evident by this study.

CANADA

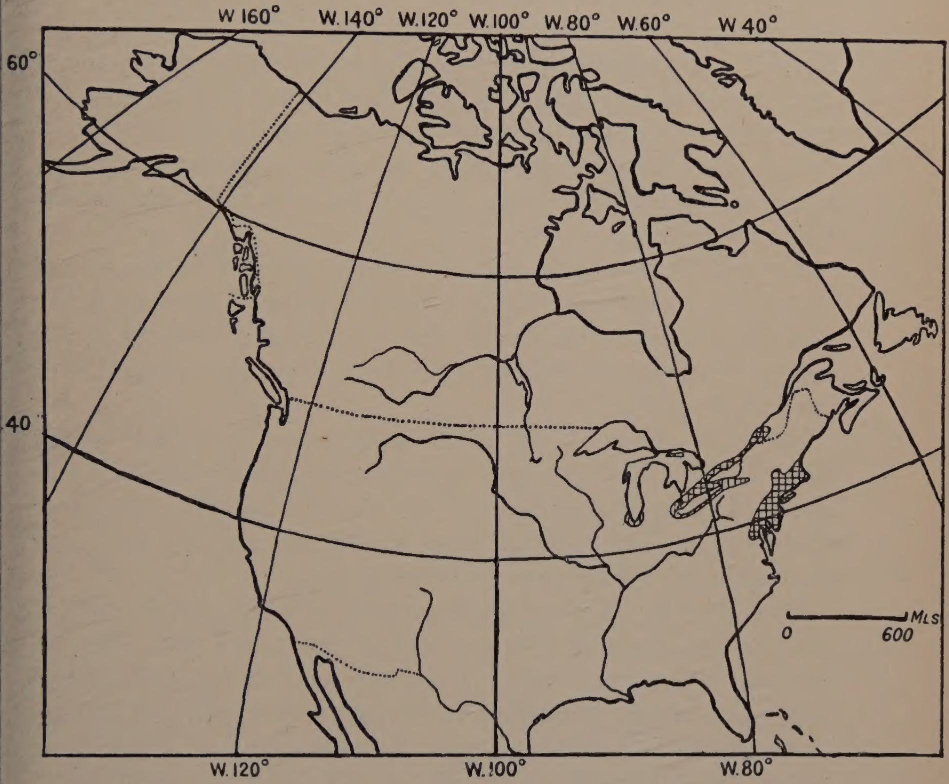
The area of concentration of population in Canada is a long and comparatively narrow strip of land which extends from the head of Lake St. Peter, on the St. Lawrence forty miles below Montreal, up the St. Lawrence Lowland and along the northern shores of Lakes Ontario and Erie to the extreme end of the Lake Peninsula at the boundary river St. Clair.

The length of this strip of land is nearly 550 miles, but its width nowhere reaches a fifth, and averages less than a tenth, of that distance. The area of all the counties whose populations are included is 57,951 square miles, but more than a third of this area is that of the almost uninhabited parts which extend on to the higher land to the north of the lowland, especially in Quebec Province. The total population at the census of 1931 was 4,455,623. Thus there is here on approximately 1 per cent. of the total area of the Dominion no less than 43 per cent. of its total population, with a mean density of nearly 120 persons per square mile.

Of course this population is not evenly spread over the area. More than a fourth of it is in the eastern end, in and around the city of Montreal. West of this there is a thinning out, on the poorer lands in the easternmost counties of Ontario Province. This is succeeded by the populous areas on the southward slopes of the Lake Peninsula, with a second main concentration of nearly a million people in and around Toronto.

This populous region includes the greater part of the fertile lowlands of "Old Canada," i.e. of the provinces of Ontario and

Quebec; and it has always contained the great majority of the population of those two provinces since the settlement of Ontario by the United Empire Loyalists. In 1871, just after the formation of the Dominion, but before the opening-up of the prairies to settlement, it contained 56 per cent. of the whole population of Canada; and it still exceeded 50 per cent. in 1901. But the rapid peopling of the prairie provinces in the next two decades reduced this proportion to 41·7 per cent. in 1921. Since then the greater growth of industry here and a slackening of immigration into the prairies has caused a rise; and the proportion of Canada's population in this, its most populous area, in 1931 was 42·9 per cent.



U.S.A.

The chief area of concentration of population in the United States is a well-marked band along the Atlantic coast, from the southern border of Maine to the northern border of Virginia.

It extends inland as far as Albany on the Hudson River, and to the mining districts of eastern Pennsylvania. South of New York City its axis is the "Fall Line" from Trenton to Washington.

The area of the small states and the parts of the larger states of New York and Pennsylvania, with one county of Virginia, which occupy this populous zone totals 53,666 square miles, and of this perhaps one-fifth is in the thinly peopled mountain belt; and some parts of the coastal plain, in New Jersey, Delaware, and Maryland, are also thinly peopled. The length of this zone is about 450 miles, and the width from the coast inland nowhere exceeds 150 miles. It is of nearly the same area as the populous region of Canada already described, and covers about 40,000 square miles, nearly $\frac{1}{75}$ part or $1\frac{1}{3}$ per cent. of the total area of the continental United States.

The population of this populous area at the date of the census of 1930 was 26,763,912, with a mean density of more than 600 persons per square mile. And it then included 21·8 per cent. of the total population, as compared with 20·3 per cent. in 1900 and 21·6 per cent. in 1870.

The chief centre of population is the conurbation of "Greater New York" with 8,330,000 inhabitants. It also includes two others of the six "million-cities" of the United States in "Greater Philadelphia" and "Greater Boston."* There are also two other very large cities, Baltimore and Washington.

This is by far the most populous area in North America, and it has held that position ever since the establishment of the English colonies. But there is also a secondary area of concentration of population about the eastern Great Lakes, partly in Canada and partly in the United States. The Canadian part has already been noted. There are some 3,000,000 people round the western and southern shores of Lake Erie, and more than 1,000,000 in western New York State, south of Lake Ontario and east of Lake Erie. The area round these two lakes is the second area of concentration of population in North America, with about one-third the population and less than one-fourth of the density of the Atlantic coast area. Its division by the international boundary along the lakes makes of it two separate areas for many purposes.

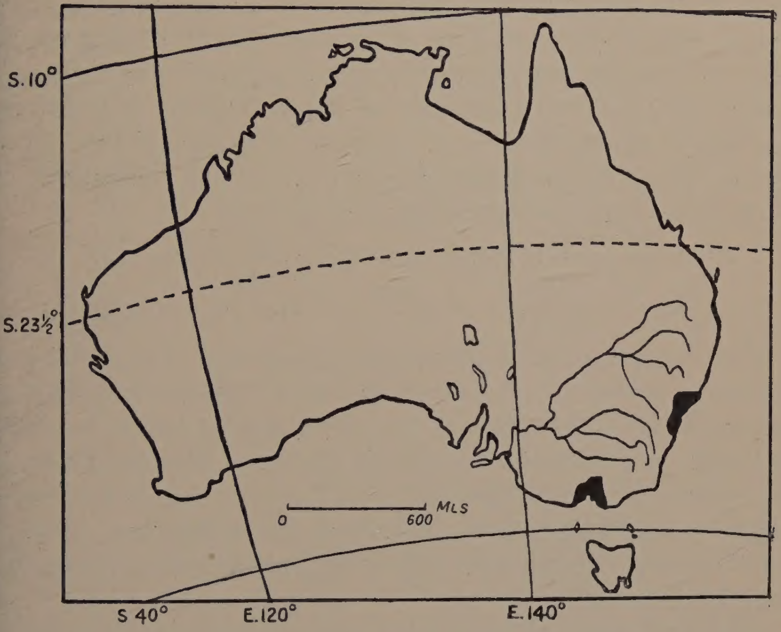
A similar smaller area appears round the south end of Lake

* See article by Mark Jefferson on "Great Cities of 1930 in the United States" in the *Geographical Review*, January 1933, pp. 90–100.

Michigan. In fact, we may say that the southern parts of the Great Lake shores—about Michigan and Erie—are lesser areas of this type.

AUSTRALIA

The concentration of a large proportion of the inhabitants of Australia into the state capitals is so striking a fact that it has attracted the attention of almost every student of conditions in that country. There are, however, two small areas of maximum concentration.



In New South Wales the narrow coastal lowland is usually not more than ten or fifteen miles in width, except in three small areas where it expands to over fifty miles. Of these expansions of the lowland, one is immediately behind Sydney, in the valley of the Hawkesbury River, and another is in the valley of the Hunter River, only seventy miles north of Sydney. The five counties which occupy these two expansions of the lowland (and part of the highlands also) have a total area of only 11,592 square miles, which is a little less than one twenty-fifth of that of the state of New South Wales, but they include the only two large towns, Sydney and Newcastle, and a total population of 1,681,196 in 1933. The proportion of the total population of New South Wales in this small area was 53 per cent. in 1891, and it increased to over two-thirds in 1933.

Proportions of the Population of N.S.W. in the Five Counties.

1891	1901	1911	1921	1931 (est.)
53·3 %	54·1 %	56 %	63·2 %	66·7 %

In Victoria there is a similarly populous area on the lowland about Port Phillip and the Kilmore Gap through the highlands behind it. The six counties which occupy this lowland (and a little of the neighbouring highland) have a total area of 9,368 square miles, which is a little more than a tenth of that of the state of Victoria, and included in 1933 a population of 1,238,309. The density, and the proportion of the inhabitants of the state, are very similar to those in the corresponding area of New South Wales. This area contained 54 per cent. of the inhabitants of Victoria in 1891 and 68 per cent. in 1933.

Proportions of the Population of Victoria in the Six Counties.

1891	1901	1911	1921	1933
54·5 %	54·8 %	58·7 %	65·4 %	68 %

This concentration of population in and near the capital is a feature common to all five of the states on the mainland of Australia. More than half of the population of South Australia is in and near Adelaide. About half of that of Western Australia is within the metropolitan district of Perth. And more than a third of the inhabitants of Queensland are in Brisbane. There is only one large town in Australia other than the five state capitals, namely, Newcastle.

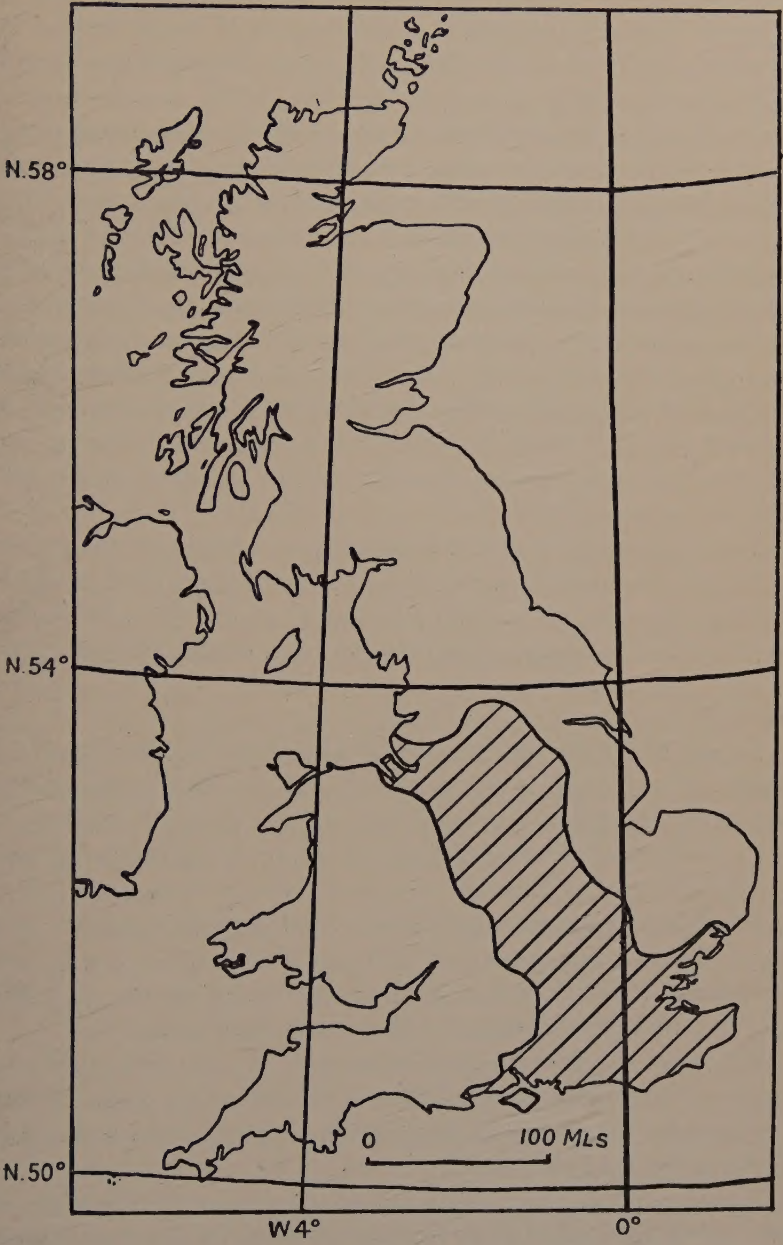
The two areas of maximum concentration of population referred to, about Sydney-Newcastle and Melbourne respectively, together occupy only 0·007, less than 1 per cent. of the area of Australia; but they include no less than two-fifths of its population. The figures are:

Percentage of the Population of Australia in:

	1891	1901	1911	1921	1933
(*a*) Sydney-Newcastle area .	18·9	19·5	20·7	24·4	21·9
(*b*) Melbourne area	19·5	17·5	17·3	18·4	18·6
(*a*) + (*b*)	38·4	37	38	42·8	40·5

GREAT BRITAIN

The growth and arrangement of population within Great Britain has been spread over a far longer period than in the other English-speaking lands, and hence the present distribution is influenced to a much greater extent by past conditions. Also from about 1750 to 1850 there was a very marked accumulation of population on several of the more important coalfields which has had no parallel in the other countries; and these masses of population



still influence the distribution very greatly, though the pre-eminent importance of the coalfields in this respect is a thing of the past.

There is an area of marked concentration of population in the form of a zone extending diagonally across England from south-east to north-west. The south-eastern third of this zone is occupied by the London conurbation and its satellite towns as far as the coast. The north-western end contains the great conurbations of South Lancashire and West Yorkshire. The intermediate sections include the Birmingham district, the clusters of towns in the middle and upper Trent Valley, and a large number of other urban areas. In the last intercensal period (1921–31), three-fourths of the increase of population of Great Britain was in this zone. Nearly all the rest of the island showed a relative decrease of population, interrupted only by two small urban areas which showed a relative increase; while to east and west, and north and south, of the zone of concentration there were areas of absolute decrease of population.

This zone across England covers approximately 18,000 square miles, or about a fifth of the area of Great Britain. And it had in 1921, 56 per cent. of the total population, a proportion which rose to 58 per cent. in 1931, when its population numbered 25,805,915.

TRENDS

In all five areas (or zones) of concentration described the movement of population in recent decades has increased the proportion of the total population of the country dwelling in the area of concentration. This is, of course, a part of the general movement towards growing cities, and of the increasing concentration of great commercial and industrial organizations in these areas. But it is not merely a "drift to the towns." It is a general movement ("drift" if you like) to particular groups of urban centres, from other towns as well as from rural areas.

The mean densities of population are from 120 to 150 persons per square mile in the Canadian and Australian areas of concentration to over 600 in that of the United States, and nearly 1,500 in the English zone.

Hence none of these areas is self-supporting, in the sense of producing the food and raw materials needed for the maintenance of its inhabitants. All of them import the greater part of their bread-stuffs from other regions; and the two more densely peopled also import most of the animal food that they consume. Geographically and politically it is a very important feature of the English area that it alone of these food-importers must draw the greater part of those necessary food-stuffs from oversea lands outside the direct control of the state of which it is a part. Economically it is obvious that such a dependence on water-transport in place of land-transport is no handicap, rather the reverse, so long as political conditions do not prevent or restrict the free flow of required materials. But the dependence on satisfactory and stable political conditions is an unsatisfactory basis in the world of to-day. New England is as completely dependent as Old England on the import of food and raw materials from distant regions; and some of these are more distant in terms of transport costs. But the areas and the routes on which New England is chiefly dependent are all within the continuous territory of one Power; those of England are across the high seas, which are open to all, and in the territories of various states—a difference of geographical situation which causes a wide difference of outlook on external and foreign affairs between the two countries.

These recent movements of population indicate that we are nearing the end of the "pioneering" period of emigration which was so characteristic of most of the nineteenth century. That was a movement from relatively densely peopled countries to thinly peopled and fertile regions. Now the trend is from the areas of relatively low density to the already thickly inhabited areas of concentration—a complete reversal of the trends of last century. The causes of the change are complex; and here I venture to list only the following as among the chief:

1. The increasing mechanization of agriculture and the resulting reduction in the number of workers engaged in it.
2. The urbanization of many formerly rural occupations; the change from handicraft to factory work is usually also a shift from a rural area towards an urban centre.
3. The improvement in the yield of crops and animals, which checks the tendency to extend the area of agricultural land and may soon lead to a reduction of the areas under cultivation.
4. The check to the increase of population, and so to the demand for increase in food-supplies.
5. The natural gregariousness of mankind.

All these factors check the move towards the pioneer zones of agricultural settlement. And the check is already obvious in North America and in Australia, in both of which there are examples of retreat from such areas.

It is true that such emigration of agricultural settlers has not quite ceased. The settlement of the empty fertile lands of Manchuria by migrants from North China was delayed, mainly by political factors, till recent decades; and it has been by far the largest movement of the kind within the twentieth century. Yet there seems little prospect of any more large-scale migrations of this type. In our own country the last two years have seen a direct reversal of the nineteenth-century current of outward migration.

Such migrations of intending-agricultural workers could be carried on till all the cultivable lands of the earth are fully occupied; but only if the settlers are to be contented with the standards of living to be obtained from a subsistence agriculture of the peasant type. If they desire a higher standard than that they must be dependent on access to a market capable of absorbing their surplus products at an attractive price. And the existing agricultural areas already produce sufficient to supply the existing markets among the non-agricultural populations. Further development of this kind of settlement seems improbable. The prospect is rather that there will be a movement towards the intensification of agriculture in areas nearer to (i.e. more accessible from) the great masses of consumers.

The trend towards a steadily wider outspread of population has, in the English-speaking lands at least, come to an end. It is being replaced by movement towards a relatively small number of areas of concentration. The attraction of the "wide open spaces" is less powerful than the attraction of the cities. The pioneering period of agricultural emigration is over. It belonged to the age of expanding population, and was one of the important reactions to the expansion marked by the Industrial Revolution. Now the methods and organization of that revolution are being applied to agriculture, and the attraction of the cities has freer play.

What are the factors which have determined which areas shall be areas of concentration, regions towards which large populations are attracted? Obviously these are the areas which do, on the whole, offer more favourable conditions for obtaining a good livelihood. But it is clear from a brief survey of the five such areas we have noted that this is not the result of any one single advantage.

None of these areas is specially distinguished by soil fertility or by mineral wealth, though none of them is wholly without such resources. The decisive factors seem rather to be the advantages of geographical position and of natural and developed routes of transport, which make them particularly favourable areas for the collection together of all the varied materials needed for the equipment and maintenance of a modern civilized society. It is not pre-eminent wealth in a few commodities, but facilities for bringing together and working up the wide range of commodities needed that makes a region favourable for the development of a large society of civilized people.

Such concentration, with a diminishing population, implies a relative abandonment of some other areas. And if the trends to which I have drawn attention become stronger, we may see some of the thinly peopled areas become less and less populous, until they approach the state of having no permanent inhabitants.

It appears probable that the next International Population Congress will take place at Dresden in the early part of September 1935.

THE POLISH INSTITUTE FOR THE SCIENTIFIC INVESTIGATION OF POPULATION PROBLEMS

RESEARCH ON DIFFERENTIAL FERTILITY IN POLAND

By STEFAN SZULC

Professor of Statistics, Independent University of Warsaw

THE Polish Institute for the Scientific Investigation of Population Problems was founded in 1931 in Warsaw. It was incorporated and its statute registered on May 18, 1931, the first meeting having been held on November 21st of the same year.

The following extracts from the Statute will best indicate the aims of the Institute, its formation, and the type of its organization:

Par. 2. The aim of the Institute is the scientific study of problems of population. The Institute does not entertain or seek to define any policy on population matters.

Par. 3. In line with par. 2, the Institute, with a due regard for the laws and regulations binding in the country,

(*a*) organizes and conducts scientific research on all problems connected with or arising out of population matters, besides affording its support to such investigations as may be undertaken by special bodies or by persons working in the domain of science representing this branch of knowledge;

(*b*) publishes the results of scientific research in this field of endeavour;

(*c*) organizes its records in archives and conducts a library;

(*d*) co-operates with allied Polish and foreign bodies working on the investigation of the problems and tasks outlined in sections (*a*) and (*b*) of this paragraph, and is, moreover, especially authorized

(*e*) to join the International Union for the Scientific Investigation of Population Problems, founded in Paris on July 5, 1928, and to act as the Polish Section of the said Union, assuming all the rights and duties arising out of such affiliation to the said Union in accordance with its Statute.

Par. 6. The Polish Institute for the Scientific Investigation of Population Problems is composed of the following categories of members:

(*a*) Active,
(*b*) Ordinary,
(*c*) Honorary.

Par. 7. Active members of the Institute may be:

(*a*) persons working on the scientific aspects of the problems envisaged in par. 2 herein, and who actively participate in the work of the Institute;

(*b*) all scientific bodies whose field of work embraces research on the problems set forth in par. 2 herein, and who directly participate in the activities of the Institute.

Par. 8. Ordinary members of the Institute may be any and all persons who, though not answering all the necessary requirements envisaged in par. 7, are

(*a*) of age and who work on the scientific aspects of the problems set forth in par. 2 herein, or who collaborate in the activities of the Institute;

(*b*) scientific and other bodies, if their work is connected with the activities of the Institute.

Par. 9. Honorary members may be such persons who have distinguished themselves by their special merit or services in the domain of scientific research on population problems.

Par. 10. Active and Ordinary members are admitted by the Executive Committee upon its constitution, and prior to that by the founder-members of the Institute.

Par. 11. Honorary membership is granted by the General Meeting upon the motion of the Executive Committee.

Par. 27. The Executive Committee of the Institute consists of five Active members elected by the General Meeting. The Executive Committee is elected for a term of two years, but its members are eligible for re-election. In addition to these five members of the committee, the General Meeting elects two deputy committee-men.

Par. 28. The President of the Executive Committee is appointed by the General Meeting, but the two vice-presidents, the secretary, and the treasurer are elected by the members of the Executive Committee from amongst their number.

As will have been noted from the foregoing, the Statute of the Polish Institute for the Scientific Investigation of Population Problems is modelled upon that of the International Union, and upon those of the national committees comprising the Union in question. The Polish Institute intends to collaborate in all international activities undertaken in the domain of demographic research.

The first, and present, Executive Committee is composed of the following persons:

President: Dr. Ludwik Krzywicki, Professor of Sociology at the University of Warsaw; Vice-Presidents: Dr. Marcin Kacprzak, Chief of the Medical Statistics Section, State School of Hygiene, Warsaw, and Mr. Stefan Szulc, Professor of Statistics at the Independent University of Warsaw; Secretary: Dr. Jan Mydlarski, lecturer at the University of Warsaw; Treasurer: Mr. Ignacy Kräutler, Chief of Section, Chief Bureau of Statistics of the Polish Republic.

In view of the very modest resources available during the opening stages of its existence, the activities of the Institute have been so far concentrated on only one subject of research,—on the investigation of fertility in Poland. Soon after the Institute was set up the Executive Committee appointed a special commission for the conduct of this research under the chairmanship of the present writer.

The work of the commission has been fundamentally based on an inquiry on the number of children in families. The method adopted was identical with that followed in other countries for similar investigations, and basically corresponds to the system applied in certain countries during the taking of censuses of population, as, by inserting appropriate questions into the questionnaires as to the number of children, it aims to throw light on the fertility of married couples.

After conducting a trial inquiry on a small scale in one of the larger Government offices in Warsaw, the following text of the questionnaire was established:

QUESTIONNAIRE

	Husband	Wife
1. Birthplace..............................		
2. If not born at the present dwelling-place, how long domiciled there?.....................		
3. Date of birth		
4. Religion		
5. General and special education..............		
6. Profession, rank, or position in same........		

7. Date of marriage................. If husband or wife dead, give date of death: died on: ....Day........Month......Year (husband or wife).

If divorced or separated (legally or by mutual consent) give date: .... (strike out if unnecessary).

Note.—If married a second time, for questions 1–7, give answers also covering the preceding marriage, dividing the "Husband" or "Wife" column into two parts.

8. How many rooms is the home composed of? (Kitchen counts as a room) ....
9. How many persons live in the home? ....
10. Number of children living .... Number of children dead ......
11. Children.

	Date of birth	Date of death
1.	....	....
2.	....	....
3.	....	....
4.	....	....
5.	....	....
6.	....	....

Note.—Date of birth of every child should be given, whether still alive or not, even if death ensued immediately after birth; for deceased children, give date of death. If some of the children were offspring of a previous marriage, state which children.

Information regarding the preceding generation.

12. Profession of husband's father ....
13. Total number of children born to husband's parents..........
14. Profession of wife's father..........
15. Total number of children born to wife's parents ....

(Should the form be completed under specially favourable conditions (e.g. by a physician), questions 16–21 should be answered.)

Special Questions.

16. Have any contraceptive methods been used? Yes or No ....
17. If so, state which and when (if several, enumerate them all):

Which?..........
When? ....

18. With what result? ....
19. Have contraceptives been used as a result of medical advice?..........
20. Were there any abortions? Yes or No ....
If so, enumerate them all:

When? ....
Were they spontaneous or induced? ....
Were there any direct complications after abortions? ......

21. If of the female sex, was the person questioned ever treated for women's diseases? Yes or No..........
22. If so, state when, and which diseases ....

Supplementary remarks

In the fundamental questionnaire the number of questions was limited as far as possible, and only the simplest were retained, as it was expected that difficulties would arise in completing the form, especially among the lower classes, which it was chiefly desired to investigate. None the less, a number of factors which could have some bearing on fertility were included: thus, religion, trade or profession, education, dwelling conditions, birthplace (chiefly in order to distinguish between rural-born city-dwellers and those of the second (or later) generations born and living in urban areas).

The form was completed for persons still married at the time of the inquiry, for widowers, widows, divorced, and separated persons. As a general rule the questionnaire was filled out by special workers of the Institute, and only in certain exceptional circumstances were the persons investigated permitted to complete the form themselves. Whenever possible, the persons examined were induced to state their opinions on the matters connected with the object of the inquiry.

The success of the inquiry, as outlined above, depends chiefly on the: (1) appropriate selection of centres to be investigated; (2) proper methods of utilizing the material collected so as to obtain the most exact standards of measurement of fertility possible.

In respect of the first condition, the Institute, in view of its scanty resources, was to some extent restricted in its choice of centres to be examined: it proved necessary to avoid territories where investigation would entail excessive expenditure; the centres in question likewise had to be limited in number, and the same limitation applied to the number of families investigated at each centre. In these circumstances great care had to be exercised in the choice of such centres. In particular, it was attempted to embrace groups as homogeneous in type as possible (rural population in a given district, working-class families living under certain fixed conditions, office-workers of a certain type, etc.). It was ascertained that by examining such homogeneous groups, even when the material secured would be based on a very limited number of observations (one hundred, or even fewer, families), it was possible to formulate conclusions which it would have been impossible to justify even on the basis of a much larger number of observations on any heterogeneous groups.

With regard to the second essential, it would appear that in the investigations on fertility conducted heretofore, the data amassed have been much less intensively utilized than might have been the case. Quite naturally, observations should, when being worked up, be classified as carefully as possible according to all those features which may have any bearing on fertility. This, as it would seem, very obvious postulate has, however, not always been respected during the course of investigations in various countries, and this failure has diminished the value of the results which might have been attained.

In addition, investigations so far have been limited, on the whole, to ascertaining the total number of children (number born or number alive at the time of the inquiry) in married households of various types, in relation to the duration of the marriage, age of parents, and other factors. If the investigation is based on a general census of population (in which questions as to the number of children living can only be included, and under favourable conditions, possibly also the date of marriage, and the date of death of a deceased husband or wife), any other working up of the data is really impossible. When investigations are based on very abundant material, and the classification of married households, according to distinguishing features, is carried out in sufficient detail, such highly valuable contributions can be produced as that of the General Register Office of England and Wales, and of Scotland, on the *Fertility of Marriage*.

In special inquiries it is, however, possible to secure exact data not only on the course of the marriage (date of marriage and of its dissolution, if any) but also the date of birth and of possible death of each and every child. In such cases there should be no difficulty in reconstructing the whole past of the families under investigation, and in arriving not only at a final result in the shape of the total number of children born, but also in the exact measurement of the fertility both at the time of the inquiry and as far back into the past as the history of the families examined goes. The investigations of the Institute have nearly always been successful in reconstructing data on fertility from the beginning of the present century, and, in some cases, as far back as from the end of the nineteenth century, i.e. working backwards to about forty years ago.

The natural doubt may of course arise if marital fertility in the past, ascertained in this manner, can really be in agreement with the actual data on fertility of population groups some ten or twenty, or up to forty, years ago. Deviations can be due to two reasons.

First, the social category to which each given family belongs is determined on the basis of its present social status, although this may obviously be different to the one it had in the past. For example, a family which has been classified as belonging to the unskilled industrial working-class may have lived in a rural district twenty years ago, and have been engaged in agriculture; its fertility-rate in the past would therefore be incomparable with that of working-class families. In some social categories such a circumstance may be virtually negligible, whilst in others it may play a greater rôle, and the drawing of conclusions may demand great caution. Nevertheless it should be possible to add such questions to the questionnaire which would permit the reconstruction of the past history of a family in this respect likewise.

Apart from this consideration, a method consisting in the reconstruction of the past on the strength of relations then holding good in families still existing to-day in their entirety, or in the persons of a few survivors, may lead to a selection which will be artificial, inasmuch as the fertility-rate of still existing families may be different to that of families in the same category, but in which both parents died before the inquiry was undertaken. Such an eventuality cannot be ruled out in advance. If, by means of questioning families in which at least the husband or wife still survives, we succeed in reconstructing the more distant past, then we have to do with a married couple in which at least one of the pair is marked for his or her longevity, whilst we exclude such couples in which both the members died early. It is not only possible, but even probable, that the shorter life of a married couple may not only exert an influence on the total number of children born, but also on the fertility-rate, although conditions may be otherwise identical. Just how potent a factor this is (if it exists at all) cannot for the time being be determined: in any case, its influence would be greater the more distant the past which it is desired to reconstruct.

Yet, in spite of all these reservations, by the proper calculation of rates of fertility (if such can be computed at all) we can secure data of great importance, and which can by no means be disregarded.

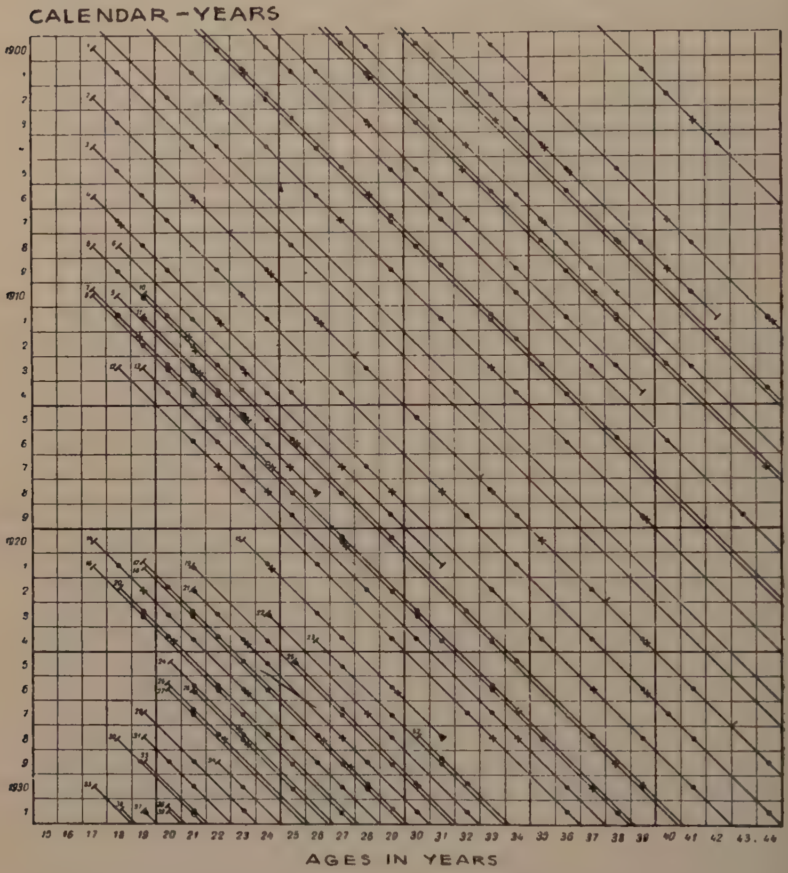
The fact that the calculation of fertility-rates is not usually applied in investigations is doubtlessly explained by the fairly great technical difficulties encountered in computing them. This is so since for every period examined it is necessary to determine both the number of children born and the number of families observed: this is a somewhat unwieldy procedure, especially if classification according to the age of the mothers, essential in this case, be introduced. The Polish Institute for the

Scientific Investigation of Population Problems in such investigations has applied a method which, as far as is known, has heretofore not been used, and which will therefore be described below.

The method in question fundamentally consists in transferring observations on individual married households on to a graph, and in making calculations directly on the basis of such graph. The graph itself is not a novel one. It is based on the methods in general use for many years past for the representation of data on mortality. Ordinary graph paper is used (with one axis representing calendar years and the other the age of the persons investigated), upon which the course of the given life is plotted out, i.e. in this case that of a married woman from the day of her marriage to that of its dissolution or of the end of her period of fecundity. The Institute has accepted the principle of placing calendar years on the perpendicular axis from top to bottom, and years of life (age) on the horizontal one, from left to right. In this manner the life-line runs at an angle of 45° diagonally downwards towards the right. If now all the data on married women in the group under consideration be transferred on to the graph, and all the facts of interest noted at the appropriate points, we shall for any period desired be able to compute direct from the graph both the total number of years lived by the women of the given group and the number of children borne by them during the period in question. Naturally it is possible to note on the graph any other facts which may be of interest, and which it is desired to connect up with the course of the life of the person under investigation; it is also possible to secure readings of ascertained facts in various combinations if necessary by appropriate modifications of the arrangement of the graph or card.

The graph given as an example (see page 22) shows the application of the method outlined above. The numerical data upon which the graph is based covers one of the centres investigated by the Institute—a Protestant agricultural community in the east of Poland. The population of this group, living in isolation and very little subject to the influence of surrounding communities or of outside factors, is remarkable for the early age at which its members marry and for its very high fertility. Reconstructing this material upon the model graph, certain slight modifications have been introduced for the sake of greater clarity.

As the investigation was made at the beginning of 1932, the curves end at the bottom of the graph with 1931 as the last year of observation. The lowest age accepted on the left is fifteen years, as marriages are not made earlier. Every marriage curve commences at the middle of the square representing the calendar year (age of the woman) in which the marriage took place, and



ends in the centre of the square representing the calendar year of dissolution of the marriage by death of one of the couple, by divorce or by separation, or passes out of the graph at the bottom where the last year of observation ends, or at the right side when the period of fecundity is passed (the model graph given herewith covers the period up to the age of forty-five). The points on the graph represent the date of birth of the children, the crosses indicate the date of death of offspring; one and the other have been placed in the centre of the period (calendar year and age of mother) to which they refer. In the case of death of children, no note is made as to which child is affected.

A concrete example will best serve to demonstrate how the graph is to be read. Let us take the square contained between the thicker horizontal lines separating the year 1919 from 1920 and 1924 from 1925, and the perpendicular lines separating the age of 29 from that of 30 and the age of 34 from that of 35. This represents the observation period as from January 1, 1920, to January 1, 1925. The age of the women under observation lies between 30 and 35 years. Within this period there were eight marriages of women aged 30–35 years. Of these, one lived only 1 year of conjugal life, three lived 2 years, three lived 4 years, and one (ended in 1921, let us assume in the middle of the year) lived 1½ years. The data yield the total of 20½ years of married life during the period in question for women of 30–35 years of age. Births came to 8 (dots): the relation is therefore one of 8:20·5, or 39 births per 100 years of married life expresses the fertility-rate.

The rather considerable experience which the Polish Institute for the Scientific Investigation of Population Problems has had in the application of the above technique has demonstrated the fully serviceable nature of the graph. Information from the questionnaire can be quickly transferred to the graph, it is easy and possible at any time to check up the entry if the serial number of the particular family covered is inscribed at the beginning of each line. Readings of the entries (calculation of births and of years of married life) can likewise be readily carried out if the graph has been carefully executed, and if on a suitable scale, as also if there is no excessive massing together of lines running along the same track, i.e. of lines referring to women born in the same year.

This last feature, the impossibility of inscribing a large number of observations on one graph, is perhaps not so much a weak point as an advantage of the method. This is so because larger than moderate-sized groups of families are eliminated from consideration in advance, some few score are all that can be covered at the most—and this again forces the investigator to make calculations for every group separately. In order to achieve this end the material can be divided into any grouping desired (arriving at the total will be quite facile), but it will naturally be better to create family groups having common features which it is supposed can have some bearing on fertility. In handling large groups, it has proved advantageous to treat separately those women who married at a given age (by separate year-of-birth groups). This facilitates the determination of fertility-rates in relation not only to the age of the women, but also to the duration of the marriage, the determination of the total number of children born, and those still living in relation to the course of time which has elapsed since the marriage took place.

An important problem in method arises in connection with the treatment of the first period after the marriage in cases where it is desired to calculate the years of married life. Naturally, under normal conditions the first child born should not appear before the lapse of nine months, and these months should not therefore be considered. In the work of the Institute so far, the year in which the marriage commenced has been disregarded, i.e. an average of six months has been deducted. This was technically the easiest way out of the quandary. Deducting six months instead of nine to some extent makes up for the fact that some of the births could have had their conception before marriage; in view of the fact that the date of birth of the children could not always be quite exactly ascertained, it proved on the whole impossible directly to deduct pre-nuptial conceptions.

It should also be kept in mind that, calculating fertility-rates in this manner, a different procedure is followed than when computing marital fertility on the basis of general censuses of population and on that of birth-records in which the age of the mother is taken into consideration. For those mothers in the lower age-groups, when we have to do for the most part with newly wedded couples, the difference may be very great. If, then, we desire to conduct a comparison with the data afforded by general statistics, we must make supplementary calculations, taking the first year of marriage as being of six months' duration.*

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* This matter is, however, more involved than is generally supposed. In the contributions presented by Gini in Mexico (1933) and in Rome (1934), which appeared after the plan of working up the data was determined upon by the Polish Institute, attention was drawn to this circumstance. He likewise pointed out that it is necessary to exclude pre-nuptial conceptions when determining coefficients of marital fertility, as also, when calculating the number of years of married life, to deduct in connection with the birth of each child a certain period of time during which a new conception cannot take place. Gini himself deducts one year.

Naturally the working up of the material amassed by the Institute was not restricted to the calculation of the coefficients of fertility-rates: as the need arose, other lines of attack on the problem were applied. In particular, good results were yielded by ascertaining the total number of children born in wedlock during consecutive five-year periods of the marriage. Moreover, the very detailed material furnished by the inquiry aids in solving various special points of interest, such as beginning and end of the period of female fecundity (age of mother at the time of first confinement and of the last), duration of period of female fecundity, mortality of children in relation to the total number born in a given family, etc. Such and similar problems will certainly crop up from time to time in the future, and will demand attention as the working up of the material proceeds.

Apart from its basic inquiry on the number of children in families, the Polish Institute has endeavoured to approach the problem of differential fertility from another angle. Amongst the methods applied was an inquiry directed to all the physicians of Poland with the request that they communicate the results of their direct observations on the attitude of various classes of the community to fertility matters. The ordinary questionnaire form was simultaneously sent to these physicians, the special questions, already mentioned, having been, of course, included. The number of replies received was not as large as had been expected, but those received yielded much valuable information on a little-known problem, whilst the replies covering the physicians' own families are of superlative importance in view of the admirable sincerity and serious purpose with which a considerable number of the informants treated the subject. The material contained in the replies thus furnished by the physicians of Poland will be presented in a separate report.

Obviously these corrections introduce important changes in data on fertility in relation to the age of the mother, and can greatly modify the relative fertility-rates of various countries. There can be no doubt that the enormous differences which appear in international comparative data on the coefficients of marital fertility-rates as regards newly wedded couples owe their origin to this factor: to the difference, if we may so call it, in pre-nuptial customs. The correction, applied by the Polish Institute, to some extent eliminates the inaccuracies arising when the ordinary method of calculating marital fertility is applied. None the less, these standards of measurement require fundamental improvements. Cf. C. Gini, *Su la curve della fecondita matrimoniale della donna seconda l’eta*, London 1934.

PRESENT SCOPE AND SOME RESULTS OF INVESTIGATIONS

Poland presents an exceptionally favourable terrain for the investigation of differential fertility as she is passing through a transitional period; although she still has high natality on the whole, she is one of the countries having a declining birth-rate.

Forty years ago, about 1895, a birth-rate of nearly 45 per 1,000 inhabitants was a fairly uniform figure for the territories composing present-day Poland. By the last few years before the war this figure had already dropped to well below 40 per 1,000. After the war, in 1922–25, the figures oscillated at about 35 per 1,000, and then began slowly to fall, but up to 1931 inclusive, never below 30 per 1,000. In 1933, which cannot be considered as a normal year, there were only 26·5 births per 1,000 inhabitants. Although this figure is high for European conditions, none the less a drop from nearly 45 per 1,000 to 26·5 per 1,000 during less than forty years is undoubtedly a great one.

A map prepared by the Chief Bureau of Statistics of the Polish Republic on the basis of data for 1931 * shows a birth-rate of less than 20 per 1,000 in only a few of the larger cities and towns of Poland. A few rural counties in the west, near the German frontier, and some in the south-east (with a mixed Polish-Ukrainian population) have a natality of from 20 per 1,000 to 25 per 1,000. Some of the districts of East Poland and in the foothill belt of South Poland are marked for their high natality, but only four counties have a higher birth-rate than 40 per 1,000 (but below 45 per 1,000).

There can be no doubt that the differences in natality which depend on the factor of class allegiance are much greater than those connected with geographical location, indicated above.

The general figures of vital statistics will of course throw some light on certain of the questions arising in this connection, but it will only be possible to undertake such investigations when the final results of the 1931 Census will have been fully worked up. And even then the data in question, in Poland as elsewhere, will not permit of sufficiently far-reaching and searching investigation being conducted.

In the first series of investigations engineered by the Polish Institute for the Scientific Investigation of Population Problems about 16,000 replies were received in connection with its inquiry

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* *Informations Statistiques*, No. 19, Warsaw, 1932.

on the number of children in families. The larger community-groups examined included replies from the city of Warsaw, numbering over 3,000 completed forms furnished by various categories of wage-earners and Government and private salaried office-workers; about 4,000 replies from the city of Lódz, likewise for the most part furnished by wage-earners and by salaried office-workers; various groups of the rural population (independent peasant farmers) from various parts of the country, some of the groups being fairly large, numbering 1,000 and more persons. Smaller groups represented various professions and sundry geographical districts of the Republic. Of the professional groups, that of the physicians was examined in greater detail.

The material amassed is a little insufficient for some of the details to be investigated. Dealing with the poorer and less educated classes, it often proved difficult to secure exact dates in respect of the birth of husband or wife, of marriage, of birth and death of children. This deficiency was especially to be noted with regard to deceased children; there can likewise be no doubt that some of the children born many years ago, and having died in early childhood or in infancy, must have been overlooked or omitted altogether.

So far the detailed working up of only a few groups has been put through: the results secured have been published in the *Kwartalnik Statystyczny* (*Statistical Quarterly*) issued by the Chief Bureau of Statistics of the Polish Republic (in Polish, with French summary), and in the *Warszawskie Czasopismo Lekarskie* (*Warsaw Medical Journal*). The remaining data have to date only been partly worked up. In any case the results already secured are so clear-cut and appear to be so characteristic that it would be well to report on them in this paper.

FERTILITY IN THE VARIOUS GROUPS INVESTIGATED

The results for several groups of the population are first of all given in the shape of coefficients of fertility-rates in relation to the age of the women. These coefficients have been calculated here and further in this paper up to the age of forty-five, in view of the insignificant number of observations on children borne by mothers over that age. The data refer to the post-war period, from 1920 to 1931 or 1932, depending on the years covered by the material furnished for the given groups.

In Table I, Group 1 stands out in striking relief owing to its

Table I

Fertility-rates per 100 *Years of Married Life*

Period : 1920–1931 *or* 1920–1932

Group	Age of Women					
	Up to 19	20–24	25–29	30–34	35–39	40–44
	Rural population (independent peasant farmers)					
1	80	64	50	43	27	13
2	54	49	38	34	25	14
3	52	41	28	27	18	10
	Unskilled-workers' families					
4	(80)	39	26	22	15	7
5	58	39	31	23	18	2
	Skilled-workers' families					
6	56	33	21	16	10	3
7	(50)	28	19	14	6	2
	Office-workers' families					
8	—	27	19	11	6	—
9	73	33	16	10	6	3
	Physicians' families					
10	(50)	38	21	14	7	1

Note.—The figures given in brackets are based on a very small number of observations. A dash (—) indicates the lack of data for calculating fertility-rates.

Group 1 refers to middle-class rural population; Groups 2 and 3, rather poorer classes of the rural population; Groups 4, 6, and 8, city of Warsaw; Group 5, a small manufacturing town in South Poland; Groups 7 and 9, the city of Lódz; Group 10, physicians in various parts of Poland taken altogether.

enormously high coefficient of fertility. The group in question is the agricultural community in East Poland already mentioned herein—one which is cut off from external influences and is relatively prosperous, inasmuch as its members own sufficient land to maintain their families. The two following agricultural groups are marked by much lower, although still very considerable, fertility. The fertility-rate for unskilled manual workers is lower than for agriculturists, still lower for skilled manual-workers, and lowest for office-workers. These proportional relations are for that matter not peculiar to Poland alone. Fertility in the families of physicians finds its closest analogy rather in that of skilled manual-workers.

It is most characteristic, although on the whole this has already been remarked on elsewhere, that the drop in fertility passing from the first groups to the end ones is greater the older the women are. If the basic index number of one hundred be accepted as representing the average fertility-rate for every given age-category in Groups 2 and 3 (thus excluding Group 1), then for other groups the following rates would be yielded:

TABLE II

Fertility Indices

Fertility of Agriculturists (Mean of Groups 2 and 3 = 100)

Mean of Groups	Age of Women					
	Up to 19	20–24	25–29	30–34	35–39	40–44
4 and 5	135	87	86	74	77	38
6 and 7	104	68	61	49	37	21
8 and 9	143	67	53	34	28	12·5

From the foregoing it will be seen that all decrease in fertility begins at the groups of elder women, and in relatively little measure affects younger married women: this observation appears in all the investigations of the Institute with striking force and without any exceptions.

Comparing the coefficients in Table I with the data on marital fertility yielded by general statistics, it should always be borne in mind that the mode of computation mentioned above is different, i.e. the year in which the marriage took place has not been considered when determining the number of years of married life. Making the calculation by the ordinary means, it would appear that the fertility ascertained for Group 1 finds no equivalent in any data furnished by general statistics: fertility appears to be much greater. On the other hand, the fertility-rate of office-workers (Groups 8 and 9) corresponds to the lowest figures known according to the material afforded by general statistics: this fertility is such as has been calculated, using the data for 1924–26 in the case of the German cities of Leipzig and Hamburg. The fertility-rate of skilled manual workers is lower than the appropriate general figure for England in 1921, but somewhat higher than for France in 1925–27. This would mean that with earlier marriages and a fairly low mortality-rate this fertility still suffices to maintain the population at the level noted heretofore, and perhaps even to yield a certain natural increase.

The fertility-rate for the agriculturists (Groups 2 and 3) is approximately the same as that reported for Scandinavian countries and for Germany sixty years ago.

In order to facilitate a comparison of fertility in the various groups and with that in other countries, standardization of fertility-rates has been effected in the Polish work reported upon herein, it being accepted that the mutual relationship of the various age-categories for married women is identical with that determined for Poland on the basis of the General Census of 1921.

The following standardized rates of fertility are then yielded for certain of the groups studied by the Institute and for certain foreign countries:

Fertility per 100 *Married Women*

Poland: Rural population (Group 1)	38·0
Skilled manual-workers (Group 6)	16·3
Office-workers (Group 8)	11·4
Other countries (figures calculated on the basis of general statistics):	
Scandinavian countries and German states in 1870–80	31–33
South Poland (Galicia) in 1900–1901	28·7
England and Wales in 1921	20·4
France in 1925–27	13·6
City of Leipzig in 1924–26	11·0

The foregoing shows the great diversity in the coefficients ascertained for Poland, as also to what low levels fertility has fallen in some groups.

CHANGES OF FERTILITY IN TIME

Investigating changes of fertility in time, it should be always remembered that, as stated above, a certain number of children may have been disregarded in the questionnaire replies, and that such omissions must quite naturally refer in greater measure to the more distant past than to the more recent. For this reason failure to determine a drop in fertility cannot be accepted as conclusive proof that such decline did not take place: this is so because former fertility may have been calculated at too low a level. On the other hand, whenever the coefficient for more distant periods is found to be higher than for more recent ones, it can be accepted that a drop in fertility has been ascertained beyond all doubt.

With these reservations made, it is now possible to state the following:

In the rural districts, on the whole, no drop in fertility has been noted, with the possible exception of fertility among the women of the highest age-category, above the age of thirty-five; at these ages, fertility in post-war years is lower than before the World War. In certain rural districts the last few years, beginning with 1930, have been marked by a distinct drop in fertility, but the relatively few observations made do not permit any categorical statement of the fact.

A sharp slump in fertility has been noted for all groups of the urban population studied, this applying especially to the working classes. Standardized fertility-rates of married women, according to the various calendar periods investigated, are given below for skilled manual-workers (Group 6) and for office-workers (Group 8) covered in Table I.

TABLE III

Standardized Fertility-rates of Married Women

Period	Manual-workers	Office-workers	Manual-workers	Office-workers
	Rates		Indices (Period prior to 1900 = 100)	
Prior to 1900	38·8	20·4	100	100
1900–1909	28·9	16·6	75·8	81
1910–1914	23·7	11·3	61	55
1915–1919	14·7	14·1	38	69
1920–1924	20·0	14·7	52	72
1925–1929	15·7	10·4	40	51
1930–1931	8·4	11·0	22	54

The drop in fertility among the manual-workers can confidently be termed catastrophical. It was already very great before the war, but in post-war years it has been very rapidly nearing, it would appear, to the absolute exhaustion of fertility. It should, however, be borne in mind that in this concrete case we have to do with a category of the population which lives in very specific conditions: observations on the other groups of manual-workers likewise indicate a sharp and great drop in fertility, but not to such an alarming extent as in the instance cited above. The decreased fertility of the office-workers is also considerable, but its acceleration is much smaller, this being primarily explained by the fact that fertility in this category of the population was already low before the war. In view of the specific selection of centres investigated, an over-bold generalization of the above statements would be hardly advisable, although other observations have led to the same conclusions.

FERTILITY IN RELATION TO THE DURATION OF MARRIED LIFE

Perhaps the most interesting results secured when investigating differential fertility are those yielded by simultaneous considerations of the age of the women and the number of years they have been married. The matter in hand is not novel in itself; it is well known that at identical ages of women their fertility is lower the more years they have been married. The investigations of the Institute were, however, rather hampered, inasmuch as small groups were for the most part examined whilst the double division of the material available (by age and by duration of married life) caused great disintegration of the data to occur. None the less, in those cases where the data secured were sufficiently numerous, the results depicted were remarkably clear-cut and definite. The table given below refers to two groups of the population marked by their different demographic conditions of life: a rural population with a very high fertility-rate (Group 2, Table I), and physicians with a low fertility-rate.

This table is not, be it noted, arranged directly according to the time which has elapsed since the marriages were made, but according to a combination of the age of the women when entering wedlock and when later observed (when a child was born).

Reading this table from top to bottom, a drop in the fertility-rate of married women of identical ages is to be observed as the women get older simultaneously with the duration of married life extending with time. Reading from right to left, we discern the fertility of women of identical ages in relation to the number of years of married life. Finally, reading diagonally from right to left downwards, we have data on women having identical duration of married life, but of different ages. Thus, reading from right to left, we note a rapid decrease in the rates, but reading diagonally we find on the sloping rows in question that the rates are, if not identical, then very much closer to each other, independently of the age factor, at least up to the age of about forty. *It might almost be possible to risk stating that the values of the rates are virtually unrelated to the age of the women, but almost solely vary with the duration of married life.*

TABLE IV

Fertility-rates in relation to Age of Women when Entering Wedlock

Rates per 100 years of married life

Age of Women when Child Born	Age of Women when Marrying				
	Up to 19	20–24	25–29	30–34	35–39
Agriculturist (Group 2). Period: 1920–31					
Up to 19	54	x	x	x	x
20–24	45	55	x	x	x
25–29	34	40	50	x	x
30–34	33	31	40	57	x
35–39	21	25	27	41	80
40–44	11	15	15	20	33
Physicians' families. Period: 1920–1931					
Up to 19	50	x	x	x	x
20–24	25	42	x	x	x
25–29	4	18	31	x	x
30–34	5	9	14	44	x
35–39	—	4	8	14	.
40–44	—	1	—	1	.

The decrease in the fertility-rate as the duration of the marriage becomes longer appears here with exceptional force. Of course, an investigation cannot be considered as concluded with this comparison: the material must also be more abundant and the methods of analysis applied must be more precise, whilst above all the methods of mathematical statistics must be utilized. If, however, we succeed in generalizing our observations (and none of the rather numerous observations of the Institute have yielded any results at variance with the above), then the whole method of research on marital fertility will have to be other than that in use heretofore.

In reference to our investigations, perhaps the most striking fact is that the phenomena observed appear with equal force in the case of the rural population, with its high fertility-rate, and in that of the physicians, where the rate is very low. The difference consists solely in this, that the drop in the rate is quicker and more radical in physicians' families than in those of agriculturists. Whilst in the case of the latter category fertility continues, although greatly weakened, to the limit of physiological possibility, with physicians' families fertility really dies away completely already after fifteen years of married life, even if the marriage was a very early one. On the other hand, immediately after marriage the fertility-rate for physicians' families is by no means small, for it is but little below that of agriculturists' families, even when the marriage took place relatively late, as in our example, i.e. at the age of 30–34 years. The lack of a sufficient number of observations in the material available to date as to marriages commenced at a later age does not permit the carrying out of observations to the desired conclusion.

The Polish Institute for the Scientific Investigation of Population Problems has tried to attack this problem in another manner. Namely, it has ascertained the total number of children born during the first five, ten, etc., years of married life. It usually transpired that the total number of children born of married couples who entered wedlock at the age of nineteen or under is lower than for couples who married at the age of 20–24, and not greater than for couples who married when 25–30 years of age. The adverse difference for couples who married very early appears with redoubled force if not all the children born be taken into consideration, but only those still living after a given number of years of married life have elapsed: child mortality is greater if the woman married very early. These remarks are based on observations of families having many children.

COMPARISON WITH THE PRECEDING GENERATION

Data on the present and on the preceding generation could only be secured in fairly restricted scope on the basis of Questions 13 and 15. For this reason any comparison which can be drawn must likewise be of a rather limited nature, thus only two items of interest were examined.

1. *The total number of children in the present generation was compared with the corresponding figure for the preceding one.* In groups marked by declining fertility, naturally, the number of children in the present generation is lower than for the former one: this fact can be noted even on the basis of observations of still existing marriages. In groups not marked by a dropping fertility-rate, such as those of certain rural centres, the number of children reported for the preceding generation proved to be equal to that of dissolved marriages in the present generation—of course, after making the necessary corrections in view of the artificial selection of families having many children in the preceding generation. (As is known, determining the number of children in the preceding generation by selecting present-day married households by chance, yields an artificially enhanced average number of children for the former.) But if consideration be given to the fact that doubtless in replies to the inquiry the full number of children born to given parents was often not given, whilst the reporting of more children than were really born could have taken place only very exceptionally, it appears that in these centres the number of children born has nevertheless more probably fallen.

2. *Heredity as a factor in the number of children born to the parents of the preceding generation and to those of the present one.* Nearly all the investigations conducted to date on this point have yielded a uniform conclusion: there is a distinct correlation between the number of children borne by mother and daughter, but absolutely no signs of the influence of heredity are to be observed in the male line. This correlation appears very clearly likewise in the case of dissolved marriages of the present generation (dependence between the total number of children in both generations), as also in that of existing marriages of the present generation (dependence between the total number of children born in the preceding generation and the incomplete number of children born to the present one).

The foregoing remarks and statements as to observations, as also such which have for the time being not been presented, should be treated rather as hypotheses and as formulations of problems to be investigated than as solutions. Further researches are under way, and it is to be hoped that they will yield the expected results.

THE PROBLEM OF DEPOPULATION, WITH SPECIAL REFERENCE TO BRITISH NORTH BORNEO

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(Read at the International Congress of Anthropological and Ethnological Sciences, London, 1934.)

WHILE on scientific expeditions in Borneo in 1931 and in 1932, for the purpose of collecting blood grouping and other genetic and anthropological data, family histories were taken concerning some three thousand natives. These natives were drawn from districts some of which, according to the census, show an increase and others a decrease in population during the last ten years. Although the study of the question of depopulation was not one of the principal aims of the expeditions, nevertheless the data collected may provide reasonable material on which to base a discussion on this important subject. One gathers that the multiplicity of suggested causes for the depopulation found in the Pacific is only equalled by the disagreement of observers as to the real causes. While it is reasonable to suppose that there are, in reality, many causes acting, and that these causes may vary with local conditions, it is just as reasonable to suppose that if there be any fundamental causes, these will be common causes found operating, in the large majority of the cases, in complete independence of whether secondary causes are acting as well or not. It is therefore proposed to take a number of the factors which are generally considered to be important in the Pacific Islands and to see which of them, in one's limited experience, also apply in Borneo. It will be argued that those which are found to apply in the widely different conditions existing in both the Pacific Islands and in Borneo may be considered as the more fundamental and primary causes of depopulation of native races in general.

On page 9 of *The Report of the Census of the State of British North Borneo, 1931*(1), are given the percentage increases or decreases of the native population compared with 1921 in the various districts of that State. In Table I are reproduced the figures which apply to nine of these districts, which were visited by our expeditions.

In the Report, various reasons are given for these figures—some are explained by administrative rearrangement of boundaries, some by changes in ethnic nomenclature, while some of the decreases are left unexplained. It is interesting to compare the following data with those above. The following cannot in any way be looked upon as supplanting or even supplementing the census figures, because they were taken merely as secondary information during the routine blood grouping, and by no means was every person in a kampong examined.

Though incomplete, the figures should constitute good random samples. The following was the information (relative to the subject under discussion) which was elicited from each of the natives examined: status (single, married, widow, or widower, or divorced), number of children (if none, the number of years married was noted, and only those married for one or more years without a pregnancy were used in our tables; if married more than once, the number of children resulting from each union was treated separately; the number of children dead was not noted earlier in the investigations, hence while the numbers of living children per family should be fairly accurate, the number of births is almost certainly too small).

TABLE I

District	Increase	Decrease
	Per cent.	Per cent.
Jesselton, Suburbs, and District ..	108·49	—
Sandakan, Suburbs and District ..	47·93	—
Kotabelud	28·18	—
Tenom	27·14	—
Tambunan	0·94	—
Kudat	—	0·24
Kinabatangan	—	2·24
Tuaran	—	8·08
Keningau	—	18·59

As stated above, these figures should be good random samples, especially where they deal with the inhabitants of a kampong which was actually visited. There one was just as liable to examine a parent with children as one with none; but it may be argued that where the natives came from distant kampongs, the number examined would tend to include more single persons and more persons without child encumbrances or family responsibilities. That may be so, but it is doubtful. In such cases children turned up in large numbers out of curiosity, and where only one parent came the family data was obtainable. Although the method of taking these data may mitigate against its accuracy, the same factors will modify each group of results in the same way, and hence should not affect the *comparative inter-tribal value* of the data.

In Table II are given the number of matings investigated in each tribe, births per mating, surviving children per mating, percentage of sterile matings, and the percentage of matings at present childless, while in the last column are given the percentage increases or decreases as shown on pages 36 and 37 of the Census Report.

TABLE II

Tribe	Number of Matings	Births per Mating	Living Sibs per Mating	Sterile Matings, per cent.	Childless matings, per cent.	Census Report, Increase or Decrease, per cent.
Bajau (Kotabelud)	21	4·48	3·10	4·76	4·76	20·36
Dusun (Kotabelud)	102	2·31	2·05	16·25	14·71	26·06
Dusun (Tambunan)	277	2·15	1·66	25·00	30·69	0·97
Kwijau	76	1·75	1·47	17·11	28·95	190·26
Murut (Keningau)	169	1·34	1·07	36·69	45·56	50·76
Murut (Bokun) ..	209	1·30	1·13	33·97	46·67	—

At first sight it may appear that the percentages of sterile and childless matings are far too high, for surely one-half of the Bokun married couples are not childless. But it must be remembered that these data include *all* matings entered into by each individual examined. For example, if "A" has been married four times, having no children by any of his first three wives, and four children by the fourth, this fact is shown as four separate matings. A casual observer sees only the present mating with the four children, and does not appreciate the three previous and hidden childless matings. This state of affairs was found to be very common, no children apparently being very good grounds for divorce, or rather an excellent reason for a man to divorce his wife. Incidentally the frequency with which this was encountered leads one to conclude that the desire to have children is still pronounced amongst these natives, and hence the lack of this desire is not a common cause of fall in population amongst these peoples.

This table shows the tribal variations in size of family, and that sterility corresponds with the births per mating except amongst the Kwijaus and the Dusuns. The tremendous percentage increase of the former is explained in the Report as being due to the difficulty of accurate racial classification, some of the natives being classed as Muruts in 1921 and as Kwijaus in 1931. The discrepancy between our figures, as far as the Kotabelud Dusuns are concerned, is due to the fact that those examined were mostly from the small kampongs of Kabayau, Koung, and Dallas, and this can hardly be held to form an accurate specimen sample of the larger communities which contributed to the 13,528 people enumerated in the Census. This illustrates a very important point, that in North Borneo the depopulation seems to be more marked in tribes which consist of small, scattered and more or less isolated, communities. The correspondence between tabulation of tribes by the Census and the above data lends weight to the contention that the latter, though admittedly meagre and incomplete, may be of value for *comparative local racial studies.*

Let us now consider some of the factors which are generally considered as being most important in the process of depopulation in the Pacific, and see what their comparative values are in Borneo.

1. DISEASE

Disease is claimed to be a causative factor in depopulation in the Pacific Islands, mainly on account of the introduction by Europeans of measles, tuberculosis, influenza, dysentery, venereal diseases, etc., among races previously free from them. Owing to the absence of any degree of acquired immunity, epidemics of such diseases have resulted in appalling increases in the death-rate. Such a factor generally acts in a dramatic fashion, the acute disease decimating whole families and tribes. If whole tribes are wiped out, the immediate depopulation will obviously be permanent; if it affects the people independently of age, the population curve will suffer an immediate marked drop, but after recovery the old rate of change of population will be re-established and in course of time the numbers will be replaced. If the effect has been more marked on the children, then the interference with the individuals who are to provide the future families will result in a more permanent fall in population. Borneo, like the islands of the Pacific, has suffered gross reductions in population by such epidemics. Early in this century smallpox, followed a year later by cholera, swept through the country. Again, in the post-war influenza epidemic thousands are said to have died. In the absence of accurate statistical data regarding these epidemics it is impossible to state whether the effect is still being felt, but it may well be that it is.

As stated above, after an epidemic—which has not unduly interfered with the future population-producing individuals—has died down, the normal growth of population continues, but at a new level. Such epidemics do not usually disappear completely, but leave in their train sporadic cases, and the diseases becoming endemic confront us with a very different proposition. These cases, together with such chronic diseases as yaws and malaria, definitely cause depopulation, and they do this not so much by an actual increase in the death-rate as by lowering the vitality of individuals. These individuals not only become a more easy prey to inter-current infections (the death-rate thus being directly increased), but their powers of procreation are reduced; thus the birth-rate is lowered; and this latter effect is the more important and more lasting in that it affects future generations as well. There is no doubt that this factor is operating in Borneo as elsewhere; fortunately it is one which modern medical services are slowly but surely learning to combat.

2. Social Poisons—Alcohol, opium, etc.

The strong spirituous liquors of the European, which have been suspected of causing so much harm amongst Pacific natives, can hardly be held to blame for the depopulation found amongst the Muruts in Borneo. The tribes in the interior have not been "civilized" to the stage of indulging in this type of alcohol. They have, however, their own type of alcoholic drink—tapai—made generally from rice, but failing that, they also make it from Indian corn or potatoes. It is made by a process of fermentation, and this, together with the fact that the huge jar from which it is drunk is continually replenished with water during the progress of a drinking bout, ensures that it is not of a very high alcoholic content. The natives, males and females, young and old, partake of this drink freely at celebrations, which are held frequently and on the slightest provocation. Excessive tapai drinking may conceivably affect the birth-rate by undermining the health of the natives, but it is doubtful whether its prohibition would have any better effect, as it would interfere with the social customs, a question to be considered in the next section. Furthermore, this long-established custom can hardly be seriously held to account for depopulation of recent origin alone; the change it causes must be as long-standing as the custom itself. On the whole it is difficult to see how tapai drinking can be considered as anything but at the most a secondary auxiliary factor in the causation of depopulation. Amongst these tribes the opium habit, fortunately, does not exist; and betel-nut chewing is such a universal custom throughout this part of the world that it cannot be held to be responsible for the decrease in population shown by a few isolated Borneo tribes.

3. SOCIAL CUSTOMS

(*a*) *Clothes*.—Amongst certain races the introduction of European clothes is supposed to have had disastrous consequences. These races were not used to wearing anything more than a loin-cloth, and were thus not aware of the importance of changing their clothing when wet through; in fact, an individual rarely possessed more than one suit. The frequent wearing of wet clothes, together with the insanitary custom of wearing them unwashed till they practically fell to pieces, was doubtless fraught with serious consequences to the wearer's health. In Borneo, numbers of tribes have their own native clothes, formerly made of bark and now of cloth; hence any change to European types does not necessitate a change in customs with which the native cannot cope. Amongst the interior tribes, native dress customs are still most commonly followed, and here it is that depopulation is most marked; but near and on the coast where European clothes are more commonly seen, depopulation does not exist. Clearly, then, this is a factor of no moment in Borneo.

(*b*) *Housing*.—No one who has lived in native buildings in Borneo could go so far as to assert that they are highly sanitary. Light comes through the only entrance—the door; there are no windows; draughts can enter through the floors and walls almost anywhere, but they fail to reduce the heaviness of the atmosphere, due to the whole village living in the one hut, and to the absence of chimneys; filthy dogs have access everywhere, and if there are any rules regarding spitting they must concern the immediate bodily comfort of the spitter rather than the general comfort of his neighbours. Such a state of affairs is by no means ideal according to our ideas, but housing conditions have been considerably improved of late and the change from age-old insanitary conditions to better ones can hardly be held to account for recent depopulation. If it were a long-standing depopulation we were considering, these conditions would be more important factors to consider.

(c) *Institutions.*—With the coming of European ideas of law and order many native customs have been either modified or abolished. In common with many South Sea Islanders, the Muruts of Borneo have had to give up their practice of head-hunting; and when one sees the listless and lazy type of life that these natives now live, one realizes the pity it is that nothing has as yet been devised to replace what was almost their sole *raison d'être*. In the Pacific it is stated that where Christianity has been able to make up this deficiency, the tribes flourish; where it has not they disappear. There, apparently, the head-hunting custom involved months and even years of boat-building and training with which no modern boat-race even could possibly compete. The training period was apparently a very busy time for everyone—rowers, fighters, and the native counterparts of seconds and newspaper reporters. There was a great incentive to breed a family of youths who could take an honourable part in such a conflict. In Borneo, on the other hand, authoritative descriptions of head-hunting activities leave one with the idea that it often entailed nothing more than beheading isolated and defenceless women and children; this was so at any rate in the early stages of a feud, and even in the later stages when the warriors were involved the fighting consisted mainly of ambushing a few hunters from the enemy tribe—a type of battle which demands no great periods of systematic training. Lack of general fitness may reflect itself in lessened procreative faculties, but the disappearance of such customs in Borneo cannot be considered to have caused such deterioration in the physique and general fitness of its natives, as a similar disappearance is claimed to have caused in the Pacific. It may, however, be quite reasonably claimed to produce a psychological effect by the removal of one of the zests for life, an effect of enough importance to demand separate consideration.

4. PSYCHOLOGICAL FACTOR

In the last chapter of *Essays on the Depopulation of Melanesia*, W. H. R. Rivers(2) deals at length with this factor; but it is quite obvious from the examples he gives that the loss of interest in life is not itself a primary cause of depopulation, but the result of other causes. "A native who is ill loses heart at once," he says. Exactly. The illness produces the unfavourable psychological attitude. Some other factor, such as ill-health, insufficient nourishment, or interference with important social customs is necessary to produce this unfavourable psychological condition, and once produced the effect of the primary cause is greatly increased, and thus a vicious circle is created. The psychological condition is a symptom of a more deep-seated disease, and it is the disease itself which demands treatment and not the symptom. Treat the disease successfully and the symptoms will disappear. Rivers in his chapter proves the symptomatic nature of this psychological condition by the type of treatment he recommends. He would, in addition to rectifying bad sanitary conditions, faults in housing, clothing and feeding, restore their old social customs in a form compatible with European ideals. In other words, he would treat the psychological factor by dealing with the real causes, and thus is revealed the true nature of this factor—it is an *effect* of the real factors, the second step in the vicious circle, thus being a secondary, and not a primary, factor.

5. FIRE-ARMS

The introduction of fire-arms is definitely a negligible factor in Borneo. It must, of course, affect the lives of the hunting Murut tribes, but in which way it is hard to say yet. As to making the casualty lists of inter-tribal disputes heavier, such a state of affairs was only a possibility in the past. At the present, such a state does not and cannot exist, due wholly to the wise native policy of an efficient local government.

6. NUTRITION

Do the natives partake of a diet efficient in calories, variety, minerals, and vitamins? Thorough investigation of this question would well repay those who make the welfare of these tribes their life's work, as well as those who are financially interested. A short stay with these natives is not enough to allow of a definite opinion being formed, but it was sufficient to lead to the impression that the bodily intake of the average native is very little more than sufficient to supply his basal metabolic requirements. He lives very close to the nutritional border-line—dangerously close; and this being so, one can readily understand why he falls an easy prey to any epidemic, especially if what reserves of energy he is fortunate enough to possess are already taxed by chronic ill-health due to malaria, yaws, or dysentery.

But in search of the cause of depopulation of recent origin, we must try to ascertain whether the native diet differs at all from that of his forefathers. If not, then the malnutrition we are witnessing is no new thing. And again, why does the native partake of an insufficient diet? Surely this brings us back to the psychological factor, and we thus unearth the next factor in the vicious circle. Treat the primary causes and this nutritional factor will most probably disappear also, always provided that the food and the facilities for obtaining it are there.

7. CELIBACY

On page 60 of the Borneo Census are given the percentages of adults who are married, males and females being given separately. The districts of Keningau and Pensiangan, where depopulation is most marked, show the highest marriage percentages. In fact, only two of the districts which show a decrease in population since 1921 have a percentage of married adults less than the average for the whole population. From the above data in Table II we see that the Muruts show the smallest number of births and of living children per mating, and also give the highest percentage of sterile and childless matings. This would make it appear that celibacy is not a factor here, but that factors effecting fertility and child mortality are more important.

8. CONTRACEPTION, ABORTION, INFANTICIDE

Borneo provides no exception to the belief that native women have their secret and effective methods of contraception and of procuring abortion; but only officers of long personal experience who have won the absolute confidence of the natives can possibly give us information on these points, and then the information must be comparative; we must know whether these practices are on the increase or not. Then and then only can we assess the value of such practices in the causation of recent depopulation.

9. STERILITY

Sterility may be either secondary or primary. By secondary one means a condition whose cause can be explained as being due to diseases such as gonorrhoea (which act locally on the generative organs), or to chronic diseases such as tuberculosis, malaria, yaws, dysentery, which act by causing general debility. There is no doubt that sterility may be an important factor in Borneo, as shown by the above-mentioned data, and its effect as well as its frequency will be greatly increased if the natives exist on a border-line diet. By primary sterility one means that type for which we can offer no satisfactory scientific explanation. Such cases are well known to medical science, and when the parties concerned are examined, no abnormality whatsoever can be demonstrated which would account for the condition; and although an efficient examination of natives along these lines is wellnigh impossible, one would suspect from the data given that it is present in a high degree. Quite frequently one came across natives who had been married three or four times, and in each case with the same result—no children.

10. Infant Mortality

Accurate figures on this point are very hard to get, and the above data can hardly be considered accurate or sufficient to allow of an opinion being formed, but they do suggest that this, operating on an already small-sized population, is an important contributary cause of depopulation.

11. Inbreeding

Of the physiology of primary sterility we know practically nothing, but we do know from animal experimental work that sterility is a danger that commonly threatens stocks which are being closely inbred. Inbreeding as a cause of declining population has often been suggested, but is now generally discountenanced by modern writers; but that the last word has been said on this subject one cannot believe. Inbreeding does not necessarily cause sterility any more than it causes albinism; but it is the one method by which sterility and lethal factors, if present in a race, can be given the opportunity to appear in greater numbers. In Borneo it is important to note that the tribes showing the biggest decrease are those which live inland, whose opportunities to mix with other tribes are reduced to a minimum, and whose size of community is small. In the Bokun country especially is this so. Through the kindness of Mr. C. R. Smith, who was Resident of the Interior in 1932, one is able to give the approximate population of kampongs near Keningau. The total population of the 11 villages in the vicinity of the Keningau station was 1,309, giving an average of 119 per village. In the 16 villages, about 7–9 miles from the station, there were 1,781 people, an average of 111 per village, while in the 8 Bokun villages there were 870 people, an average of 109 per village. Dahlberg(3) has shown that a population can be divided up into part populations, which he calls "isolates," and it is only within these that random mating can be assumed to occur. He has also calculated the size of an isolate at which the result of random mating does not differ from that of "panmixie." In a country with a large population the isolate is large enough to give the same result as panmixie, and hence consanguineous marriage has no effect on the population. In western Europe the size of the isolate is between 400 and 3,000. From the kampong figures just quoted it is seen that the size of the isolate among the Muruts must be much smaller than that in Europe; in fact, in the Bokun country there are 148 male children and 126 female, and so unless these individuals marry outside, a male has less than 125 females from whom he has to choose his mate. This must inevitably lead to inbreeding; but what is just as important as the size of the isolate is the fact that in Europe, for instance, no two isolates are coincident; even the isolates of two brothers must be very different. Amongst tribes small and isolated as these in Borneo are, the isolates of all the members of one generation must be practically the same, and therefore the amount of inbreeding must be great. And that is why the larger tribes and those living near the coast, where there are increased facilities for travel, and where there are consequently larger and more variable isolates, do not show any signs of inbreeding, whereas the moment we come to examine the smaller tribes of the Muruts, inbreeding must occur.

This, however, would explain depopulation only, and not depopulation since the arrival of Europeans, and we are therefore up against the old question of whether the reduction in population we are witnessing is a new thing or not. It cannot be doubted that statements made by explorers as to the large numbers of natives they encountered are true, but such statements cannot be accepted as trustworthy evidence in these days. Accurate statistical data comprise the only evidence which we can really accept to form our conclusions, and unfortunately data referring to the pre-European period do not exist.

Biological history is full of instances of the price paid by races both plant and animal, which cannot cope with a change in environment, and it is certain that some primitive tribes must in the ordinary course of events be undergoing a reduction in population. The reason why all small tribes do not show this phenomenon is that mere inbreeding is not enough; there must be accompanying it selection, and in the ordinary natural course of events the characters being selected must vary not only from tribe to tribe but from time to time in the same tribe. For example, where a few generations ago prowess at head-hunting may have been important in selection, nowadays that character may be replaced by the ownership of a large number of gongs or buffaloes. A large population of heterogeneous individuals ensures that a change in environment will be successfully met by the survival of at least a percentage of the population, whereas a population of relatively homogeneous individuals—such as may be produced by continued inbreeding and selection—stands less chance of successfully negotiating a marked environmental change. The large populations of India and China, and even the large tribes of Borneo, e.g. the coastal Dusuns or those on the thickly populated Tambunan Plain, are still heterogeneous enough to react favourably to European contact, whereas the small isolated tribes fail.

CONCLUSIONS

Of all the factors put forward by the workers amongst the Pacific Islands, the only ones which are of importance in Borneo are Malnutrition, Disease, and Inbreeding, and in my opinion these factors bring about their bad effects of depopulation by working on tribes not genetically equipped to react favourably to a new environment; and therefore the reason of decrease in population is fundamentally one of genetical constitution influenced by other secondary factors, which factors may vary in importance from place to place and from time to time. If these ideas are correct, what is the solution? *The race*, as at present constituted, cannot be saved, but the *population* can. Modification of the secondary factors by thoroughly investigating, and if necessary improving, native diets and sanitary conditions, by replacing illegal customs by just as important harmless ones, etc. will certainly help, but in the worst cases the race will not be saved because it is being called upon to accomplish a task for which it has not been equipped. But the population can be saved by operating against the prime cause of the trouble, and this can only be accomplished by introducing new blood. This, of course, is an old method and one that has fallen into disfavour because it has been tried and has failed. The new tribes have fallen prey to the very diseases, etc., which caused the older tribes to die out. But surely that just adds more proof to this genetical theory put forward, because it was an attempt to maintain the population with new material which was just as incapable of combating the conditions as the old material was. Any new infusion of blood must come from tribes that have proved themselves to be capable of surviving the changed environment. By this means and this only will the population be saved, and when all is said and done, this is merely the way that nature itself copes with these problems.

The examination of this question as it affects British North Borneo has of necessity been very superficial, but it is hoped that it has drawn attention to the excellent opportunities that the tribes in this country afford for a complete and thorough physiological and genetical investigation of a question which is of great biological and economic importance. It is also hoped that the realization of the genetical aspect of this problem will stimulate investigations into the other side of this question—that is, into the reasons why many native races do *not* tend to die out when they meet the changes in environment consequent upon contact with European civilization. In no place could these two aspects be studied simultaneously to better advantage than in Borneo, where we have tribes almost side by side, some showing increases and others decreases in population.

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INDICES DE DENSITÉ ÉCONOMIQUE DE POPULATION. MÉTHODE DE CALCUL ET APPLICATIONS

Par PAUL SIMON

A L'HEURE actuelle, il est courant, lorsqu'on veut déterminer la densité d'une population, d'exprimer celle-ci par le nombre d'habitants qui sont en moyenne rassemblés par km.² dans la région considérée. Cette donnée géographique est souvent utilisée en dépit du bon sens. Combien de fois ne voit-on pas dire qu'une région comptant p. ex. 400 habitants par km.² est surpeuplée, voire même comparer cette situation à celle de certaines régions désertiques, à population clairsemée (1 à 2 habitants par km.²), pour conclure à la surpopulation des premières!

Il est incontestable que la notion de densité géographique présente une certaine utilité, ne fût-ce déjà que parce que les hommes ont besoin pour vivre d'une certaine superficie terrestre. En règle générale toutefois, la densité géographique est incapable de nous renseigner sur l'amélioration des conditions sociales à travers le temps, ni même sur la situation démographique à un moment donné. Déterminer si une population dont la densité géographique a doublé est dans des conditions meilleures ou moindres qu'auparavant est impossible si on ne dispose que de cette donnée imparfaite. Pour donner une réponse à ce problème, il est indispensable de tenir compte des conditions économiques générales. Celles-ci sont, en effet, primordiales, et les possibilités économiques permettent seules de déterminer s'il y a ou non surpopulation, car si l'homme est lié au sol, ce qui le fait vivre ce n'est pas la superficie qui le supporte, mais ce sont ses actes économiques. Les conditions économiques permettent à un pays à haute densité géographique d'enregistrer un haut niveau social, une densité économique moindre qu'une région a faible densité géographique, comme la Sibérie p. ex., mais à haute densité économique.

Pour préciser les notions dans cet ordre d'idées, nous préconisons le calcul et l'emploi *d'indices de densité économiques de population.*

Nous les appelons indice de densité économique par opposition à l'indice de densité géographique, pour la simple raison que le rapport calculé porte, non pas sur la population et la superficie territoriale, mais sur la population et les ressources économiques en général.

Suivant les cas, les ressources économiques pourront être estimées d'après divers indices avec une plus ou moins grande précision.

Un premier indice se présente à nous, si, ayant pris une période de base = 100, nous calculons le rapport de l'indice de population et de celui de la production.

Si, considérant une même région à différents époques, nous calculons son indice de densité économique Δ en prenant pour base la branche économique qui domine dans la région (agriculture, industrie, commerce, banque, etc.), nous obtiendrons avec plus ou moins d'approximation une séries de termes, d'indices de densité, nous donnant l'évolution de la population de cette région. Disons immédiatement qu'avec les données dont nous disposons actuellement, c'est presque la seule façon dont nous puissions calculer l'indice de densité économique de population.*

Appelant
Δ l'indice de densité économique de la population considerée,
δ l'indice de densité géographique,
α l'indice de productivité,
nous obtiendrons Δ par application de la formule;

$$\Delta = 100 \frac{\delta}{\alpha}$$

On se rend aisément compte que Δ indique dans cette hypothèse la situation et les variations des conditions sociales. Si α croit plus rapidement que δ, Δ deviendra de plus en plus petit. Par conséquent, tant plus petit sera Δ, tant plus grande sera la possiblité d'amélioration du niveau social.

Par conséquent, lorsque dans un milieu donné, on voit δ et α croître, Δ au contraire décroître, on peut estimer que la situation sociale est moins tendue, que les possibilités d'occupation vont croissant.

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* Le calcul des indices de production industrielle a été effectué par presque tous les Instituts d'étude des conjonctures. Il n'en est pas de même des indices de production agricole, d'activité commerciale et bancaire, etc., pour lesquels on possède des données fort imprécises.

Rappelons à cet égard qu'il n'y a aucun obstacle à ce que ces indices soient calculés différamment dans chaque pays. L'uniformisation des formules serait des plus néfastes et ne manquerait pas de fausser tous les résultats, l'importance relative des diverses activités économiques variant nécessairement de pays à pays. Toutefois pour être pleinement utilisables pour les recherches démographiques, la base de ces indices devrait être située aux environs de 1880–89, ou bien de 1900–10, afin de faciliter l'étude des conséquences de la dénatalité qui est de nos jours le plus grave problème démographique.

Pour que néanmoins cette assertion se vérifie, il est utile d'examiner si D, indice de densité économique *latente* de population, suit un mouvement parallèle.

Nous appelons D l'indice calculé par rapport à a, indice de productivité latente, que nous obtiendrons en calculant l'indice des possibilités de production de l'économie, estimées ou renseignées par statistiques suivant le cas. S'il s'agit d'un indice basé sur une estimation, il va de soi que sa valeur variera avec la compétence de l'évaluateur.

Lorsque l'écart entre a et α est faible, on pourra estimer que les renseignements fournis par le raisonnement précédent se vérifient. Si on possède de plus un indice γ des revenus globaux et γ' des revenus moyens (obtenus p. ex. en se basant sur les statistiques des facultés imposables, des salaires, etc.) et que ces deux indices croissent de la même façon ou plus rapidement que α, le résultat précédent sera probant pour autant qu'on ait éliminé toutes les causes d'accroissement pouvant être imputées à des modifications législatives.

Lors du calcul de Δ, il y aura éventuellement lieu d'affecter α ou a d'un coefficient ayant pour but de corriger soit l'accroissement de productivité individuelle dû aux améliorations techniques, soit de réduire la diminution de productivité due à la modification des conditions de travail (nombre d'heures p. ex.) afin de faire ressortir avec un minimum d'erreur la densité économique de population.

Au lieu de calculer $\Delta = 100 \dfrac{\delta}{\alpha}$, on pourrait aussi calculer Δ_1 en remplaçant δ par δ_1, indice de la population adulte comprise p. ex. entre 20 et 60 ans.

Dans ce cas, si $\Delta_1 > \Delta$, et si ce fait perdure ou s'accentue pendant une assez longue période, cela signifie que la population comprend relativement plus d'adultes qu'à la période de base, que par conséquent la population inactive, enfants et vieillards, a diminué relativement à la population totale.

Pour bien étudier les conséquences de ce fait, nous devons distinguer les pays neufs, dans la phase d'industrialisation, des pays anciens.

Dans les premiers, Δ_1 croissant indique une amélioration des conditions économiques créant un appel de main d'oeuvre supplémentaire, ce qui est irréfutable si δ_2, indice de la population adulte employée, est égal à δ_1, indiquant par conséquent que toute la population adulte est employée.

Dans les pays vieux, il y a lieu d'étudier la composition de $\delta - \delta_1 = d = d_1 + d_2$. Si d_1, indice de la population infantile, est resté stationnaire ou a décru pendant la période considérée, tandis que d_2 indice des vieillards croissait, on doit conclure à un vieillissement de la population.

On voit donc que l'écart possible entre a et α, Δ et Δ_1 peut signifier deux phénomènes très différents: soit une crise économique; soit, si d_1 décroit, tandis que d_2 croit, un vieillissement de la population. Le premier cas se vérifie aisément en remplaçant dans la formule $\Delta_1 = 100\,\frac{\delta_1}{\alpha}$, δ_1 par δ_2, et α par a; on obtiendra la formule:

$$\Delta_2 = 100\,\frac{\delta_2}{a}$$

La différence $\Delta_1 - \Delta_2$, montrera alors les possibilités d'emploi inutilisées, donnera la densité des chômeurs par rapport aux moyens de production. Une partie de ces chômeurs peut même être due à la dépopulation si certaines installations nécessitent une main d'œuvre plus abondante que celle dont elles peuvent disposer.

Le principal intérêt de ces formules gît dans le rapport:

$$\frac{D}{\Delta} = \frac{\alpha}{\alpha + k} = \frac{\alpha}{a}$$

d'où nous obtenons $$\Delta = \frac{a}{\alpha}D$$

ce qui nous permet de déterminer par rapport à une période de base judicieusement choisie, la densité optima de population.

Si $\Delta > D$, tandis que $a < \alpha$, il y a tendance à sous-production.

Si $\Delta < D$, $a > \alpha$, il y aura tendance à surproduction et à sous-population.

Si $\Delta = D$, $a = \alpha$, et la productivité optima est obtenue, toute la population étant employée.

La même formule générale $\Delta = 100\,\frac{\delta}{\alpha}$ nous permet d'étudier les conditions de main d'œuvre dans une industrie donnée, pour autant que nous ayons soin de tenir compte des remarques générales qui précèdent.

Lorsqu'au contraire on posséde les indices de toutes les activités économiques d'un pays, il est possible de déterminer Δ avec beaucoup plus de précision. Dans cette hypothèse α est remplacé par α_1, indice moyen des diverses activités économiques. C'est sa détermination qui va nous causer les plus grosses difficultés.

Admettons que l'on possède les indices de la production industrielle, de la production agricole, du mouvement commercial et du mouvement bancaire. Le problème à résoudre est de trouver le moyen de pondérér cette moyenne de telle façon que le résultat obtenu se rapproche le plus possible de la réalité.

Comme les fluctuations entre ces divers éléments sont parfois très importantes, nous préconisons en premier lieu que *la pondération varie annuellement*, ce qui permet d'obtenir un indice tenant compte des fluctuations relatives précitées.

Trois éléments peuvent intervenir dans la détermination du coefficient à appliquer à chaque indice particulier:

C = le montant du capital investi;
T = la valeur des transactions;
N = le nombre de personnes employées;

chacun de ces éléments étant exprimé en % du total général.

Admettons que nous nous trouvions en face d'une économie que nous puissions réduire au tableau suivant:

Production industrielle			Production agricole			Mouvement commercial			Mouvement bancaire		
C	T	N	C	T	N	C	T	N	C	T	N
50	30	60	5	5	10	10	50	20	35	15	10

Nous obtiendrons les coefficients c par la formule:

$$c = \frac{C + T + N}{n}$$

ce qui dans le cas présent, ou $n = 300$ (n = autant de fois 100 qu'il y a d'éléments de pondération) nous permet de dresser le tableau suivant:

Production industrielle indice = α	Production agricole indice = β	Mouvement commercial indice = ω	Mouvement bancaire indice = π
$c_1 = 0{,}4666$	$c_2 = 0{,}2666$	$c_3 = 0{,}20$	$c_4 = 0{,}0666$

Nous obtiendrons par conséquent a_1 au moyen de la formule:

$$a_1 = (c_1 a + c_2 \beta + c_3 \omega + c_4 \pi + \ . \ . \ .)$$

Pour le restant, cette méthode ne change rien à la formule ni au raisonnement général. Les indices de productivité réelle, etc., peuvent, dans les mêmes conditions que nous avons vues au début, être remplacés par les indices de productivité latente. Le seul avantage de cette méthode basée sur un indice pondéré de la vie économique est de permettre l'étude plus exacte des conditions dans lesquelles une population se trouve, ou évolue.

Nous croyons de la sorte avoir à suffisance montré les possibilités d'application et l'intérêt que présenteraient des indices de densité économique de population. Leur calcul est donc des plus simples, puisqu'il suffit de s'en tenir à la formule générale:

$$\Delta = 100 \frac{\delta}{a}$$

dans laquelle on fait varier les divers éléments suivant les résultats que l'on désire obtenir.

SOCIO-BIOLOGICAL STUDIES IN THE BALKANS

By OLIVE LODGE

(*A study of the vital statistics of the peasant population set in the background of a general review of the social and economic life.*)

I. JUGOSLAVIA

An investigation of vital statistics in connection with the general social and economic life of a peasant population must consider with special interest some study of a European race living under the very "primitive" conditions which still obtain in so many of the villages in Jugoslavia, where the people live, apparently quite contentedly, almost entirely without the environmental aids of modern civilization. Those that reach adult life—a small proportion of the total birth-rate, exact figures to be given later—are usually very strong. They often live to be eighty or ninety, and I have several times come across men and women who were a hundred or over, who still retained the greater part of their faculties. But before dealing in detail with the statistical part of this investigation a short account of their general social and economic conditions would be advantageous.*

PART I

I

The villages of Jugoslavia are often situated in isolated positions far up the mountains, sometimes approached only by a mule-track. Others appear in clearings on the outskirts of forests, or in hollows or deeper depressions on the slopes of the mountain-sides, where protection is found from the winds and sudden storms which so frequently roll down rocks and boulders to lay waste the fields and crops, leaving a trail of destruction in their wake.

Two main types of villages are recognizable:

(1) Those in which the houses are close together, separated only by their farm-yards or *avlija*, and which are built on both sides of the main street and the side lanes.

(2) Those in which the cottages are scattered over the mountain-sides, often separated by a distance of half or three-quarters of

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* A fuller description of village life in Jugoslavia, including marriage customs and ceremonies, etc., will appear elsewhere.

an hour's walk. Each is surrounded by an orchard of plum, apple, pear, or other fruit trees, with fields or woods parting them from their neighbours. Peasants of different religions living in the same village tend to inhabit the same region or *mala* in that village. So, in one village may be found a Serbian or Orthodox quarter and a Moslem quarter, with, in rarer cases, a Roman Catholic quarter as well, each with its own special type of building.

Houses are still built of whatever material is most easily available, as was the custom almost everywhere until comparatively recent times. In the high mountain villages wood is used for the walls as well as for the high-pitched roofs and wide, over-hanging eaves. In the plains, daub and wattle or local stone are used, with the roofs rather inadequately thatched, or covered with slabs of rock or slate. The roofs of the more modern houses are, however, adorned with red tiles. Houses of one or two storeys are most usual, and contain one or more rooms, and a kitchen usually with a floor of beaten earth, even if boards are used in the other rooms. A hole in the rafters serves most frequently for the escape of the smoke from the wood fire, over which invariably hangs a large tin-lined copper vessel, or *bakrač*, used for heating water.

Houses are generally built on the ground; sometimes the living-rooms cover the stables and cowsheds, and are reached by an outside ladder-stairway. All the rooms open into a verandah-room, *hodnik* or *čardak*, with half-walls on the outer side. Here meals are eaten unless it is too cold, when one of the inner rooms is used. Low round tables, *sofra*, about a foot high are brought out, and everyone sits round on low wooden stools. In many parts, particularly in Macedonia and other mountainous or remote villages, the meal is eaten out of a common dish. A high wall, made of sun-baked mud bricks, encloses the farm-yard, although, round many of the houses and orchards in the scattered type of village, quick-set hedges or simply tall piles of thorn-bushes are arranged. These thorn fences have each a gate, but the only entrance to the high wall is a single strong door, which almost always has a knocker, consisting of a thick brass ring attached to a wrought brass or iron disc with serrated edges and hand-cut decorations of holes and simple perforated patterns.

In mountainous villages in southern Macedonia, like Dunje, I have come across dwellings, which I call stable-rooms, where the peasants and their stock live together under one roof. The part near the fire is reserved for the family. Here they keep their few earthenware or wooden cooking-pots, water-jars, a chest for corn and flour, with perhaps another for clothes, if they are a rich family. Here also at nights, on the earthen floor, they spread their sleeping-rugs or sheepskins. The various animals lie on straw or bracken at the other end.

Windows in all peasants' cottages are small, and may or may not be made to open. But nowadays glass is used instead of the old-time special paper, *kniži na prosore*. Sometimes there are no windows: narrow slits only are the rule in the strong stone or brick houses, *kula* (lit. tower), in Metohija. In the more northerly districts and those nearer to "civilization," tables, chairs, and beds are found, but in the wilder districts and in many parts of Macedonia, where conditions are still very rough and hard, and Turkish influence still persists, the peasants sleep on the ground on plaited rush mats and rugs or sheepskins. Each married couple and their children have a room to themselves, however small or windowless. In fact, this is a necessary condition before a new daughter-in-law can be brought home.

The peasants almost invariably own their cottages and land, which they cultivate with the help of the other members of the household, male and female. Each family is practically self-supporting, growing the requisite wheat, maize, cabbage, etc., keeping cows, pigs, sheep, and other animals. Bread, as well as wine and *rakija* (spirit distilled from plums, grapes, apricots, etc.), is always made at home. Meat also is dried and smoked at home, and cabbages, tomatoes, paprika, and other vegetables preserved or dried for winter use. The only things that must be bought are sugar, salt, paraffin, and coffee. Coffee is, however, often made from roasted barley, or the "berries" of the plant known as "wild coffee," when only very little real coffee is needed to improve the flavour. Occasionally, also leather sandals, *opanci*, or caps for the men are purchased.

II

All the peasants wear national dress. This varies in different regions, so that a man's home district is always recognizable from his clothes. The decline of national costume has already begun, with the present-day tendency to follow Western models, naturally more apparent in less remote districts. Clothes are generally made at home, except when the national dress includes ornamented leather coats or heavily braided or embroidered cloth coats, which must be made, like the braided trousers, by the special village tailor. Otherwise, the men shear the sheep, and the women wash, card, spin, and weave the wool into cloth, which they often make up also. Formerly it was the old women's work to dye with vegetable dyes the wool required for knitting or weaving the brightly coloured stockings, gloves, belts, saddle-bags, etc. Quite recently, however, it has become the fashion to send this wool to the village or town dyer, who now generally uses chemicals instead of the old-fashioned vegetable dyes. Hemp, and, in some districts, flax, are grown, and the women spin and weave them into garments for themselves and their families. Nowadays a great many hanks of raw cotton are bought and used for the same purpose. Implements, including carts and ploughs, are frequently made at home, except for the small iron plough-shares and sometimes iron rims for the wheels, which as a rule are the only parts bought in the market, although often wooden rims are used.

III

Patriarchal family groups or *zadruga* still persist in many districts. These consist of several brothers or cousins and their dependents, living together under the leadership of one man, usually the oldest or most intelligent, called the *domaćin* or *starešina*. His word is law, and anyone who will not obey must leave the *zadruga*. He arranges the work of all the members, deciding even which of the women shall work each week on the land or in the house, although once this is settled his wife determines the details of their domestic labour. Nowadays the *zadruga* is beginning to break up, especially in the more accessible villages; and at the death of the *domaćin* it is quite common for the sons to agree to live apart, each master in his own home. They therefore divide up each field equally amongst themselves, taking also their share of household and field implements.

IV

Villages have their own local government, reaching up through a chain of intermediary officials to the various ministries concerned. Each village, or each group of peasants belonging to a different religion living in that village, must have a *kmet*, or chief man, to arrange affairs. The office of *kmet* dates from Turkish times, when he was the spokesman of the Christian population in dealing with the Turks. Ten or fifteen of the smaller, or three or four of the larger villages, are grouped together to form an *opstina*, under a president, *presednik*. He is head of all the *kmets* in his *opstinal* district; his principal work consists of receiving reports and advices from them, and transmitting these to the higher authorities, from whom he in turn receives notices and orders for his district. These he must pass on to the *kmets* concerned. His immediate superior is the *načelnik*, the chief official or "mayor" of the *srez*, a district comprising several *opstinas* under one jurisdiction. Above the *načelnik*, again, numerous other officials link the village with the government and ministries.

The president of the *opstina* is chosen by secret ballot of the village assembly, or *odbor*, consisting of representatives, *odbornice*, from all the villages in his *opstina*. His pay varies according to the amount paid in taxes by these villages. A *piser* or secretary, and a *blagajnik* or treasurer, chosen from their inhabitants, are his principal assistants.

The *kmet* is elected by the village which he represents, from the funds of which he is paid. His work includes making arrangements for teachers, if the village boasts a school, as well as those for calling up the men for their military service, or sending in notices or petitions for exemptions. This is, I believe, his real *raison d'être*; his other duties comprise any business relating to the *opstina* and his village, or his group of co-religionists, and often include arbitrating in village quarrels.

V

Religion and tradition have a great hold on the peasants and play an important part in their lives. The Church's times and seasons, fasts and festivals also, are punctiliously observed by them. Sowing and reaping and other important events are calculated and dated by saints' days, just as was formerly the custom in England.

Churches are generally found in the larger or more important villages, and are often indistinguishable from the cottages in height and building material. During the five centuries after the Battle of Kosovo in 1389, when the country was part of the Ottoman Empire, the Turks permitted few churches to be built, and such as were allowed might not rise above the surrounding houses, so that the mosques might retain the supreme and undisputed honour of representing all outward symbols of religion. Extra height had, therefore, to be sought for the churches underground, by making semi-basements, with steps leading down, instead of up, to the entrance. Numbers of these small churches still remain in the villages. Besides these, many large and beautiful monastic churches which had been built by the Serbian kings and emperors from the twelfth to the fourteenth centuries, while the country was still free, are scattered over the countryside, many in isolated positions amid the wild mountains and forests. After the Turkish conquest some were destroyed and others converted into mosques. Those that remained, however, were havens of refuge for the peasants, and thither they used to repair for the great church festivals, as well as for the *slava*, or patronal festival of the monastery.

Thus the church, together with the *guslar*, or bard-singers, who went about the country singing to the accompaniment of the *gusle** the songs and legends of the Serbian national heroes and saints, kept alive in the hearts of the people the knowledge of their past history and glory, and also the desire to win again freedom for their country.† Even to-day the peasants' knowledge of their country's past history and legend is remarkable. They are perfectly familiar with the personalities and lives and adventures of the heroes and saints of old, speaking of them in the same way as they might of their own kith and kin.

VI

The marriage customs are very interesting and have important bearings on the lives of the peasants, with far-reaching results to the race. Many of these customs, as might be expected, show affinities with other marriage customs widely distributed over the world. Other old customs and ceremonies found in the Balkans, still followed by the peasants to-day, can be traced to pre-Christian origins: some to the cults of Dionysus, Attis, and Adonis, or to the Orphic Mysteries. Others, again, show Moslem influence, inevitable after five hundred years under Turkish rule.

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* *Gusle*—a simple wooden, stringed instrument.

† The whole country was part of the Ottoman Empire from the fourteenth to the early nineteenth centuries. Croatia and Slovenia remained under Turkish sway for the shortest time, being added to the Austrian Empire when the Turks were driven, right from the gates of Vienna, out of the country. Dalmatia, as well as Bosnia and Hercegovina, later became Austro-Hungarian possessions. Montenegro (i.e. Old Montenegro) was never actually conquered by the Turks because of its inaccessible mountains, but the life of the free peasants was bare and hard. Serbia was the first to throw off the Ottoman yoke, freeing herself gradually from Turkish rule in the early and middle nineteenth century, while Old Serbia, Metohija, and Macedonia were freed from their five hundred years of Turkish dominion only after the Balkan War of 1912.

Marriage is still recognized as the normal and expected lot of all healthy persons of both sexes, being regarded as a business or social contract rather than an affair of sentiment or individual choice. Incidents like that of Young Lochinvar are practically unknown. Everyone has to be married, so why, say the peasants, make a fuss over one partner rather than another? Besides, generally speaking, all women must obey all men, particularly their own fathers. Among the Albanians in Metohija the women are not so docile apparently, or perhaps they are more fastidious or passionate, for the men have repeatedly told me that one of the chief reasons they keep their wives, and in fact all womenkind, so closely confined to the house and the enclosed garden-yards is their fear that they will go off with other men. This fear, added to the danger of being themselves surprised or shot on account of family blood-feuds, explains the characteristic slits of windows in their strong brick or stone houses, and their inside closets. The closets of the Serbian peasants are always outside, generally in the farm-yard, or very often non-existent, when they, like their animals, use the fields and mountain-sides. Blood-feuds are decreasing, and in most places have disappeared altogether, but as yet no changes are apparent in the habits of the people.

Wives in many districts are bought, their price being about the same as that of an ox. This custom has, I think, been to the advantage of the race. For a man does not, as a rule, give good gold for a daughter-in-law who is not strong and healthy, able to work hard at home and in his fields and bear healthy children, when he can have his choice of all the vigorous girls in the neighbourhood. In some villages it is the custom for the respective parents to bargain over the bride-price; in others the bridegroom's father presents to the bride's father an apple full of gold coins with the request for his daughter's hand. In others, again, a single gold Napoleon is stuck into an apple and given, sometimes to the bride direct, and sometimes to her father. This, I take it, is a kind of token payment, or a relic of bygone usage. In towns in parts of Macedonia, other relics of this custom are still visible in the customary gift to the bride of an apple covered with gilt paper, with a similarly gilded twig of box in the top. Sweets, or sometimes little cakes, and two tall ornamental wax candles, are given to her at the same time.

The age of marriage varies in different districts; in some parts of Macedonia and the Sandjak it is usually from fifteen to twenty-one years, as a rule with the girls slightly older. In other districts girls are often not married until they are twenty, or sometimes even twenty-three, because their fathers are loath to give them up to work on another man's property until the last possible moment. Boys of fourteen or sixteen are sometimes married—often to girls several years older than themselves—because their mothers wish for a daughter-in-law to help with the work. Marriages generally take place earlier among Moslems than among Christians: especially is this true of the girls, who are sometimes brides when only twelve or thirteen years old. Moslem bridegrooms, however, may be of any age, and I have frequently come across quite elderly men with one of these very young brides, often as his second wife, after the death or divorce of the first. I have not, however, encountered many Moslems with more than one legal wife at a time, and the exceptions mostly resided in Bosnia.

In towns it is the custom for the girls to bring a dowry (*miraz*), and this is also found in many of the adjacent villages. A girl, whose father is prepared to give her a large dowry, can choose among the young men, any one of whom would be only too pleased to have her and her money. Thus, in a sense, these girls can be said to buy their husbands. The effect, if any, on the vital statistics of the people, when selection of a mate comes to depend upon other considerations than health and fitness, however, remains to be seen.

The age of marriage also, as would be expected, is now later in towns than in villages, and appears to be rising. This seems to be due partly to the longer time spent at school, and sometimes also at the university.

VII

Remarriage is usual, except for Serbian Orthodox priests, for whom one wedding is compulsory, since before being appointed to a parish a priest must have a wife. The peasants have told me that four marriages are permissible, but I do not know if this is everywhere the case. Certainly among Christians I have not as yet come across anyone who had been married more than four times.

In some districts, among the Orthodox Serbian peasants, widows are in great demand, because they have been well broken-in to marriage. On the other hand, in a few districts custom is against remarriage, but this is not usual. Widows who, as is sometimes the case, possess land or a shop are given a certain amount of choice in their second husbands. Nevertheless the more usual procedure is that the principal male relative of the deceased husband should choose his successor. The children generally, and always the boys, remain in the father's *zadruga*, when their mother is remarried. They are family assets, potential or actual workers on his land, or in his home, and therefore not lightly to be given up. Occasionally a more or less independent widow will not marry again, because she does not wish to leave her children, but she remains only if her father-in-law is agreeable. In one case, I know, the woman was allowed to take the youngest of her eight daughters with her to her second husband's home (incidentally, they needed more women to help with the indoor work). Again, a widow, sometimes even in the wife-buying districts, brings a dowry to her second husband. Old men often marry young girls for their second wives; and most men remarry on their wife's death, after a varying period, but frequently within the year. Custom in Bosnia allows a Mohammedan man to marry again the day after his wife's death, should he wish it, but a woman must wait at least three months after her husband's death before she is allowed to remarry.

There appears at present to be no diminution in the size of the family, except perhaps in the larger towns. The annual baby is still more often the rule than the exception. I have frequently come across couples who have had ten, fifteen, or sometimes even eighteen or twenty children; but generally large numbers have died, chiefly in their earlier years. A high birth-rate is a common phenomenon, however, in agricultural communities as a whole. Here women desire children, and those that are barren often eat special foods or bathe in the medicinal springs occurring in many parts of the country. They also pray before special ikons, and in one village I encountered a woman who had suckled her only child for several years, so as not to feel out of it amongst all her neighbours with their annual babies.

Children, particularly sons, are wanted; they are also needed, for each household or family-group (*zadruga*) cultivates its own land, without hired help. In these villages it is true that a "*son* is a son for all his life," because the sons remain in the family, bringing their wives to live in their father's *zadruga*, while the daughters marry and depart to their father-in-law's house. They are then often regarded as no longer forming a part of the family.

In the old days, and even up to the Great War, it was a very common proceeding for only one son to be sent to school. He completed the full time at school, becoming a priest, teacher, or sometimes a bishop, while his brothers remained working on their land, being unable to write or read, although quite intelligent men. One of the middle sons was usually chosen for school, for by that time the elder brothers would be able to help, taking sheep to pasture or minding cows, and doing other light work. In any case, until comparatively recently, only the boys went to school; and in many districts all the women at present between forty and forty-five still cannot read or write. But many of their daughters can, because they have been to school. Nevertheless, even among these older women I have continually met those able to read and sometimes to write also, because it was quite usual for the educated brothers to teach other members of the family after school hours.*

I have in no sense attempted to give a complete account of village life in Jugoslavia, but merely to sketch in a background to the pedigrees and statistics, while at the same time explaining the everyday life of the peasants. This is undoubtedly very hard and plain, evidently permitting only the survival of the fittest to this environment. Nor have I considered the subject of hygiene and sanitation; suffice it to say that since the war enormous strides have been made in this direction, and that outbreaks of epidemic disease, that formerly carried off large numbers of the population, are practically unknown at the present day. Tuberculosis, however, is very prevalent, and conditions of living foster its spread.

PART II

In this investigation of village life in Jugoslavia my chief aim has been the collection of family histories from villages in different districts, by taking samples of the population. I have usually visited houses chosen at random from amongst the richer, medium, and poorer inhabitants, often, in order to save time, accompanied by a local peasant, or a child borrowed from the school, as guide. This was particularly necessary in the scattered type of village, where the houses were some distance apart, reached through woods or along sheep-tracks on the mountain-sides.

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* Primary education is now compulsory for both sexes, although the law cannot always be enforced in outlying districts. The peasants, now as heretofore, are very anxious for education, parents often making great efforts to send or keep at school a promising son, or sometimes even a daughter.

In towns I visited the houses of every tenth child on the register of one of the elementary schools, *osnovna škola*, where time and opportunity permitted. If, for any reason, it was impossible to visit the tenth house, the next on the list was taken. Otherwise the dwellings were chosen as in villages, and visited according to the time available. My chief concern has, however, always been the peasant population in the villages. The pedigrees of a certain number of town-dwellers have been collected for purposes of comparison.

In choosing the villages for study I purposely went into the wilder and less-known districts, where the peasants had had much less chance of contact with Western ideas and civilization. With this end in view I avoided to a large extent the villages of Croatia and Slovenia, and the Serbian provinces across the Danube, which formerly belonged to Austria-Hungary, concentrating principally on the Sandjak, Old Serbia, Serbia, Macedonia, and parts of Montenegro, Dalmatia, Bosnia, and Hercegovina.

The majority of the peasants in Jugoslavia speak Serbo-Croatian or its various dialects as their mother tongue. They may, however, belong to the Serbian Orthodox, Roman Catholic, or Mohammedan religions, according to their environment and previous political and historical background. In addition to one or other of the Serbian-speaking Southern Slavs, some districts are inhabited also by Albanian-speaking peasants, who may belong to one or all of these three religions. (The Moslem Albanians have been converted from Roman Catholicism at some time during the centuries of Ottoman rule.) Macedonia, in addition, still retains a certain number of true Turks (Osmanli), as well as Turkish- and Albanian-speaking peasants, who are often of mixed parentage.

The inhabitants of the towns are similar, and, like the villages, vary in race or religion according to their district. But towns often also contain numbers of Spanish Jews. Lesser numbers of Jews of Polish or Teutonic extraction are found in a few towns, usually those in districts which were formerly part of the Austro-Hungarian Empire. Gipsies or *cigani* live n huts and hovels, or tents, on the outskirts of nearly all the towns, although many of the larger towns have a special gipsy quarter, *ciganska mala*. The gipsies are usually Moslems, although Orthodox and (?) Roman Catholic gipsies are found in some districts.

I have used the old historical and political names of the provinces instead of those of the nine newer administrative districts or *Banovina*, into which the country was divided a few years ago. The original districts are better suited for my purpose in that they comprise the more or less natural divisions of race or religion.

I. Serbia (the old pre-war Kingdom of Serbia), where the inhabitants speak Serbian or Serbo-Croatian as their mother tongue, using the Cyrillic alphabet, and belong almost entirely to the Serbian Orthodox Church. The greater part of the country is mountainous, but contains also great forests and plains.

II. (1) The Sandjak of Novi Pazar and (2) Old Serbia are both very mountainous. In the former the inhabitants speak a pure Serbo-Croatian, but in the latter often a local (Serbian) dialect. All are of South Slav stock, but some are Orthodox, others Moslem, while in Old Serbia Albanian-speaking Roman Catholics and Moslems also dwell.

III. Macedonia, or Southern Serbia, as it is now more generally designated, is still, as it has always been, a mixture. The Christian Slav peasants belong to the Orthodox Church, and speak among themselves a "Macedonian" or mixed Slav dialect, which varies in different parts. The Moslems are of Turkish or Albanian origins, often of mixed race. Their language is mainly Turkish, or Turkish or Albanian dialect. The country as a whole is very mountainous.

IV. (1) Croatia, partly plain, partly mountain, is inhabited by people of the same South Slav stock as the Serbians and other Jugoslavs, but whose religion is Roman Catholic. They speak Croatian, or Serbo-Croatian, and use the Latin alphabet.

(2) In Bosnia and Hercegovina all the inhabitants, except the Jews, are of South Slav (Jugoslav) stock, and belong to both the Orthodox and Roman Catholic religions, with in addition large numbers of Moslems, of the same race, who were converted from Bogomilism after the Turkish conquest of the country in the fourteenth and fifteenth centuries. Here also mountainous conditions prevail.

V. Dalmatia has a sub-tropical climate and borders on the Adriatic, having as hinterland the barren limestone Karst Mountains, which stretch into Hercegovina. The people belong to both the Orthodox and Roman Catholic faiths, speaking Serbo-Croatian as their mother tongue, though dialect is common.

VI. (1) Metohija, in which some of the inhabitants are of Serbo-Croatian race, and Orthodox by religion, though some are Moslems. Others are of Albanian race, and Moslem, Roman Catholic, and Orthodox by religion. The country is mountainous.

(2) Montenegro, of which Old Montenegro consists of nothing but mountains, though the more recently added parts contain some level land (Podgorica). The people are Orthodox and speak a pure Serbo-Croatian.

I have kept separate the pedigrees of families in the towns and villages belonging to different races and religions, as well as those from mountains and plains, in the various districts. (I am at present engaged upon comparing the size of family, infant mortality, schooling, etc.)

I give below tables showing the size of family and average number of children among Orthodox Serbians living in villages (Tables I (A) and (B)), and in towns (Tables II (A) and (B)), in the different districts, for mothers born between 1800–84, whose families can be considered complete. In cases where the date of birth of the mother was not known, I have taken that of the father. In the total number of children are included a few late miscarriages and some still-births. With reference to the number of married couples having no children, from both towns and villages in each district, I wish to make it quite clear that all of them must not be regarded as representing sterile marriages, because these figures include cases where the wife died young, or was divorced,* or where the husband was absent, working in other towns or in foreign countries. Later, when all my material is available, I shall separate the true sterile marriages from these other cases. I have left this at present because I wish to include with them figures for some of the women born later, at least up to 1889, as well as those from the large block of towns and villages contained in Ristana's pedigree.†

* Divorce is granted by the Serbian Orthodox Church through the ecclesiastical courts, *Duhovni Sud*. Perhaps one of the most common causes of divorce is sterility. Another reason is incompatibility: adultery in villages, certainly, is very rare.

† See *Population*, Vol. I, No. 2, February 1934.

I give below the average number of children per fertile marriage for complete families, also for various districts (Tables I (A) and II (A)).

District Villages	Average Children per Fertile Marriage	Total Number of Families
I	5·3	209
II	5·8	126
III	5·8	99
IV	7·9	39
V and VI	5·9	193
Syphilis villages	5·9	52
Towns—		
I and II	6·7	117
III	6·1	63

In considering who are village dwellers I have included as such sons who have left their homes to find work in a town (or in a foreign country), but generally return at intervals to visit their wives and families, remaining in their father's *zadruga*. From Macedonian villages it is quite common for the men to find work in towns as bakers or milkmen, while those from Hercegovina are more often pedlars. (Later I shall hope to make separate tables showing the proportion of men from villages who seek work elsewhere, as well as the different trades or professions followed by them.)

In Table I (A) are given complete families, in which all the children born are said to be counted. Table I (B), however, consists of incomplete families, or "families +," which remember that more children have been born, but not how many. Either this is because the children died in infancy or childhood, and the exact number (and sometimes also the sex) has been forgotten, or because they included daughters who have married and gone to their father-in-law's *zadruga* in another village or district and thus been lost sight of. In any case the records of males are generally fuller than those of females; partly because they are less likely to have been forgotten, since all men are considered more important than women, partly also because the custom was, and is still, for sons and their wives to remain in their father's *zadruga*. Even in the complete families of Table I (A) there is the possibility that some of the children (females?) have been overlooked. Again, it is probable that many of the individuals whose sex is not specified (given in the third column in the tables) may have been females who died young, about whom nothing is remembered but their birth. This may partly account for the lower percentage of females, where, in the complete families of Table I (A), the highest is 48·6 per cent., found in the villages of Croatia and Bosnia; and the lowest, 43·4 per cent., in the Serbian villages. The incomplete families of Table I (B) show a much lower percentage. This, however, would be expected, and is almost certainly due to the above causes. Here the highest percentage of 40·2 is found in the villages of Serbia, and the lowest of only 16·1 per cent. in the Croatian and Bosnian villages. But this percentage is based only on 35 families. These low percentages certainly seem to show the greater importance given to males in the family memory, suggesting also a possible connection with a greater prevalence of Moslem ideas and influence, especially since the next lowest, 30·4 per cent., occurs in Macedonia and is based on 97 cases.

The percentage of females in towns follows similar lines, with, for complete families, 48·8 per cent. (the highest) in Serbia, and the Sandjak and Old Serbia, Districts I and II combined, and 43·3 per cent. in Macedonia. The 8 families in Bosnia and Hercegovina (District IV) have been omitted. For the incomplete town families the figures are again, as expected, lower, with 41·5 per cent. for Districts I and II combined, and 37·4 per cent. for III. Figures for Bosnia again omitted.

The total number of married couples in the completed families shown in Table I (A), for all villages in the six districts, is 553, with a total of 2,792 children. This gives 5·9 as the average number of children per married couple.

The average number of children for complete and incomplete families has also been found separately for each district. This ranges for completed families from 7·3 (the highest) in Croatia and Bosnia (District IV) to 4·3 (the lowest) in Metohija, Montenegro, and Dalmatia (Districts V and VI), with the Sandjak and Old Serbia (District II), Macedonia (District III) and Serbia (District I) as intermediates, having 5·3, 5·2, and 4·6, respectively. (See Tables I (A) and (B), where the number of families, on which the averages are based, is given, as well as the standard deviation, which for completed families is always over three children, and this must be borne in mind when the differences are considered.)

For incomplete families from villages the highest average number of children, 3·8, is found in Serbian villages (District I), and the lowest, 2·9, in Croatia and Bosnia (District IV). The intermediate districts being the Sandjak and Old Serbia (No. II) with 3·4, and Dalmatia, and Metohija and Montenegro (Nos. V and VI) with 3·2, and Macedonia (No. III) with 2·9.

A group of mountain villages, often spoken of locally as the Syphilis villages, in the Pirot district of Serbia, not very far from the Bulgarian frontier, were investigated. It was thought that randomly chosen pedigrees from them would make an interesting comparison with those from other villages. But the pedigrees from these Syphilis villages do not necessarily show disease. One "clean" family has been placed separately in the tables, though included in the totals from the Syphilis villages (Table I (C)). The total number of complete families was 62, and incomplete 73, the total number of children being 297 and 285 respectively. The average number of children per family is 4·8 for complete, and 3·9 for incomplete families. This can be compared (*a*) with the average size of family of 4·9 for all the other "clean" villages in the Pirot area, where the total number of complete families is 198, and the total children 939; and (*b*) with the average for complete families from all the other villages in the six districts, viz. 5·1 children per married couple. The syphilitic average of 4·8 children seems surprisingly high, although the inclusion of "clean," or "possibly clean," families in these villages must be taken into account. Even so, it still seems high.

Report says that infection was first brought to these villages by soldiers returning from Rumania. In one village (Pakleštice), however, the disease is said to have appeared in 1915, soon after the return of men who had gone to find work in Rumania. This late introduction of syphilis would account for the similarity of the statistics from these villages and the "clean" villages in the same district. Complete families, with mothers born 1800–84, would hardly be affected, although later figures may show a difference.

A few years ago a doctor visited these villages for a week or two to give injections. To continue their treatment, many men still walk into the town of Pirot, a distance of several hours, once or even twice a week, but the women are unable to do this. In 1931, when I was there, the peasants were most anxious for another visit from a doctor. Peasants from neighbouring villages told me that now they did not intermarry with the syphilitic families for fear of having abnormal children: previously they had not realized this danger. Certainly in these villages abnormal children seemed more apparent than usual. The teacher also complained of his difficulties with normal and abnormal children in the same classes.

Table III (A) analyses the pedigrees of fifty-four families from the "clean" mountain villages near Pirot (District I), and Table (B) those of forty-six families from the Syphilis villages in the same district. Families in which the total number of births only was known, and some or all of the particulars concerning them missing, have been omitted. Details of the numbers of children dying in infancy or in childhood, or who lived to marry, as the case might be, will be found for each different-sized family. Table IV summarizes these results. No great difference between the two sets of families seems observable. The mortality of infants of one year and under, however, appears higher in the "clean" villages, being 23·3 per cent. as against 17 per cent. in the Syphilis villages, as is also that for children between two and eleven years of age, being 19·2 per cent. and 13·1 per cent. respectively. The numbers who married are very similar: 34·2 per cent. for the "clean" villages, and 39·6 per cent. for the Syphilis villages. The percentage of those who are alive and unmarried in 1931 is again higher than in the "clean" villages, viz. 25·1 per cent. and 16·1 per cent.

TABLE IV

Summary of Analysis of Pedigrees in the Pivot District of Serbia (District I). (For full details, see Tables III (A) and (B).)

	"Clean" Mountain Villages		Syphilis Mountain Villages	
	Actual Figures	Percentages	Actual Figures	Percentages
Total number of families ..	54	—	46	—
Total number of children died, 0–2 years	69	23·3	45	17
Total children died, 2–11 years..	56	19·2	35	13·1
Total children died unmarried, 12 years and over	20	7·2	14	5·2
Total numbers that lived to marry	105	34·2	106	39·6
Total numbers alive in 1931 (unmarried	48	16·1	67	25·1
Totals	298	100·0	267	100·0

The analysis for the families of mothers born after 1884 is not yet complete: in them possibly more differences may be found, since any effect due to the disease should by then be manifest. Similar analyses of pedigrees from the towns and villages in the various districts will be given later, when it should be possible to tell whether these figures are significant or not.

With reference to marriages with no children, particulars are given below of those occurring in the "clean" mountain villages near Pirot, and in the Syphilis villages in the same district.

(1) Concerning the eleven families with no children in the Syphilis villages, seven may be considered sterile marriages, since either husband or wife, or both, died between the ages of forty-five and one hundred years, or one or both of the partners are still alive. One, however, is the case of a woman, still living, who married twice, but without offspring from either marriage. Three may be regarded as doubtful cases:

(*a*) That of a second wife, probably marrying late because the first wife had ten children. However, her previous record is unknown;

(*b*) That of a first wife who died childless; but no record of the length of the marriage, or her age at death, has been kept (the second wife had three children).

(*c*) That of a married woman who died age thirty-five. Here also neither the duration of the marriage nor the date of her death is known.

One case may be regarded as certainly not sterile, where husband and wife are separated, but the length of the marriage is unknown.

(2) Thirteen cases of families without children are recorded from the "clean" mountain villages near Pirot. Of these, two only appear to be sterile marriages: (*a*) that of a couple born in 1880, still alive and living together; and (*b*) the case of a woman who is the second wife of a man who became a widower about 1896, although the exact date of her marriage is unknown. Nine cases appear doubtful:

(*a*) Five in which the second wife married rather late, and no record of her previous history is known. In each case the first wife had children.

(*b*) One with no recorded children, but no definite statement of none.

(*c*) Another, where the wife had no children and her husband lived with another woman, by whom he had a child. The death or divorce of the wife is not recorded.

(*d*) One case where the husband died young, without children, and nothing is known of the wife's subsequent career.

(*e*) Another is that of a woman born in 1882, who married a widower after 1920, but nothing is known of her earlier life.

(*f*) Is the case of a first wife who died childless in 1901–3, probably quite young. Her husband, born in 1872, very quickly married again, and had three children by this marriage.

(*g*) One is probably not a sterile marriage, the wife having died after one or two years of marriage. Her husband was born in 1870, and has never remarried.

ORTHODOX SERBIANS LIVING IN VILLAGES

COMPLETE FAMILIES, OF MOTHERS BORN BETWEEN 1800–84, IN WHICH ALL CHILDREN BORN ARE SAID TO BE KNOWN

TABLE I (A)

District	Size of Family																					
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**		M.	F.	Sex Unknown	Total Children	Percentage of Females
I. Serbia. (*a*) Užice, etc., Mountain Villages	8	5	1	7	6	2	2	4	3	2			1		1				78	65	27		43·4
Kruševac, etc., Plain Villages			1							2									10	10			
(*b*) Pirot, Mountain Villages	13	3	6	11	5	7	8	9	5	7	1	3							198	137	25		
Pirot, Plain Villages	9	4	5	9	3	5	8	9	4	3	2		2		1				151	124	31		
Caribrod, Mountain Villages	4	5	6	3	6	9	5	7	5	3	2		1						135	103	35		
Total	34	17	19	30	20	23	23	29	17	17	5	3	4		2		=	243	572	439	118	1129	

Average number of children, 4·6. Standard deviation, 3·5.

District	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**		M.	F.	Sex Unknown	Total Children	Percentage of Females
II. (1) Sandjak. Novi Pazar, Mountain Villages.. ..	3	6	5	6	4	1	7	5	3		2		3						114	83	13		43·8
Tutin, Mountain Villages	3	1		1	1				2										16	8			
(2) Old Serbia. Prizren, Mountain Villages	1	1	4	2		2	1	3	1		2	1		1					55	43	6		
Prizren, Plain Villages	1		2		1	1	1	3	1	3		2							48	39	10		
Priština, Plain Villages	1		3	2	1	1	3	4	2	2				1	3				66	54	36		
Kosovo Polje { Miloševo (Lika Settlers), Plain Villages	1		1	4	1			1		2									23	17	3		
Kosovo Polje { Gračanica, Plain Villages	1	1			1			1		1		1							14	16	2		
Total	11	9	15	15	9	5	12	17	9	8	4	4	3	2	3		=	126	336	262	70	668	

Average number of children, 5·3. Standard deviation, 3·6.

III. MACEDONIA. Tetovo, Mountain Villages		1	2	1	1	3	3	4	2	1			1						46	58	6		44·2
Galičnik, Mountain Villages	1												1						4	1	7		
Prilep, Plain Villages	5	2			4	4	5	3	3	1			1	1					76	54	17		
Dunje, Mountain Villages	2	2	1	2		2	2	1	1		1	1	1						39	25	16		
Bitolj, Mountain Villages	1	1	1	1				1		1			1						17	11	6		
Ohrid, Mountain Villages	1	2		4	4	3	2	2	2										50	30	7		
Struga, Lake Villages									1	2									14	12			
Sveti Naum, Lake Villages				1				1			1								9	11			
Total	10	8	4	9	9	12	12	12	9	5	2	1	5	1			=	99	255	202	59	516	

Average number of children, 5·2. Standard deviation, 3·3.

IV. (1) CROATIA. Plitvice Lakes, Villages	1		1		3			2		1	1	1	1						38	32			48·6
(2) BOSNIA. Travnik, Mountain Villages	1			1			1	2	2	3	2		2						55	47	8		
Sarajevo, Mountain Villages							1			5	1								23	38			
Sarajevo, Plain Villages	1				1	1	1		1		1		1						27	18			
Total	3		1	1	4	1	3	4	3	9	5	1	4				=	39	143	135	8	286	

Average number of children, 7·3. Standard deviation, 3·1.

V. DALMATIA. Dubrovnik, Sea Villages			1		1														3	3			45·9
VI. (1) METOHIJA. Peć, Mountain Villages	5	2	2	1	3		1			2	1			1					30	32	6		
(2) MONTENEGRO. Andrijevica, etc., Mountain Villages ..	5	2	2	1	3		1		5	3	1								60	44			
Podgorica, Plain Villages				1		1		1											8	7			
Total	10	4	5	3	7	1	2	1	5	5	2			1			=	46	101	86	6	193	

Average number of children, 4·3. Standard deviation, 3·6.

TABLE I (C)

I. Syphilis Villages: Mountains near Pirot	9	4	2	6	6	5	6	7	5	2	4		2						135	121	26		47·2
Clean families in syphilis village	2					1					1								8	7			
Total	11	4	2	6	6	6	6	7	5	2	5		2				=	62	143	128	26	297	

Average number of children, 4·8. Standard deviation, 3·4.

III. Malaria Village: Demir Kapija	2					2				1									14	5			

ORTHODOX SERBIANS LIVING IN VILLAGES

INCOMPLETE FAMILIES OR FAMILIES +, OF MOTHERS BORN BETWEEN 1800–84, IN WHICH MORE CHILDREN ARE KNOWN TO HAVE BEEN BORN THAN HAVE BEEN REMEMBERED

TABLE I (B)

District	Size of Family																		Issue	M.	F.	Sex Unknown	Total Children+	Percentage of Females
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16							
I. SERBIA. (*a*) Užice, etc., Mountain Villages		10	21	11	8	3	5		1	1									2	124	50	5		40·2
Kruševac, etc., Plain Villages			1		1															2	4			
(*b*) Pirot, Mountain Villages		11	8	13	12	10	6	3	4										10	147	101	5		
Pirot, Plain Villages		8	6	10	14	12	5	2	2	1	1								1	130	101	14		
Caribrod, Mountain Villages		4	6	12	22	14	5	6	4		1								12	179	135	10		
Total		33	42	46	57	39	21	11	11	2	2						=	264	25	582	391	34	1007	

Average number of children, 3·8. Standard deviation, 1·9.

District	Size of Family																		Issue	M.	F.	Sex Unknown	Total Children+	Percentage of Females
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16							
II. (1) SANDJAK. Novi Pazar, Mountain Villages ..		9	9	9	8	9	5	2	1	2									7	122	76	3		37·7
Tutin, Mountain Villages		1	1	3	3	3	2	1												34	23	1		
(2) OLD SERBIA. Prizren, Mountain Villages		5	7	5	2	1		3											2	40	28			
Prizren, Plain Villages		5	4	4	1	4														35	13	1		
Priština, Plain Villages		8	11	8	6	4	4	2			1								7	87	53	6		
Kosovo Polje { Miloševo (Lika Settlers), Plain Villages		1	1	2	2	1			1		1								1	24	16			
Kosovo Polje { Gračanica, Plain Villages		3	1	1	1															9	3			
Total		32	34	32	23	22	11	8	2	2	2						=	168	17	351	212	11	574	

Average number of children, 3·4. Standard deviation, 2·1.

III. Macedonia. Tetovo, Mountain Villages		4	6	2	3	2	1												2	31	19			30·4
Galičnik, Mountain Villages																				—	—			
Prilep, Plain Villages		2	4	4	3	7	2	2											7	63	31	1		
Dunje, Mountain Villages		6	3	1	2														1	18	5			
Bitolj, Mountain Villages		2	3	1	4			1											4	22	12			
Ohrid, Mountain Villages		7	5	7	3	1	1	1											3	54	14	1		
Struga, Lake Villages			2																1	1	1			
Sveti Naum, Lake Villages		2	1	1		1													3	8	4			
Total		23	24	16	15	11	4	4									=	97	21	197	86	2	286	

Average number of children, 2·9. Standard deviation, 1·7.

IV. (1) Croatia. Plitvice Lakes, Villages			2																	4				16·1
(2) Bosnia. Travnik, Mountain Villages		6	6	7	3	2	2													52	12	9		
Sarajevo, Mountain Villages			2	1																7				
Sarajevo, Plain Villages			1		1	1		1												15	3			
Total		6	11	8	4	3	2	1									=	35		78	15	9	102	

Average number of children, 2·9. Standard deviation, 1·6.

V. Dalmatia. Dubrovnik, Sea Villages																				—	—			32·9
VI. (1) Metohija. Peć, Mountain Villages		10	2	8	3	3	3												1	55	27	1		
(2) Montenegro. Andrijevica, etc., Mountain Villages		7	16	13	12	7	2	2	1	1									2	136	64	4		
Podgorica, Plain Villages					1															1	3			
		17	18	21	16	10	5	2	1	1							=	91	3	192	94	5	291	

Average number of children, 3·2. Standard deviation, 1·7.

TABLE I (D)

I. Syphilis Villages: Mountains near Pirot		5	8	20	20	6	8	2	1		2								11	150	112	19		42·6
Clean family in syphilis village					1															1		3		
Total		5	8	20	21	6	8	2	1		2						=	73	11	151	112	22	285	

Average number of children, 3·9. Standard deviation, 1·8.

III. Malaria Village: Demir Kapija		4	4																	10	2			

N.B.—The column of "issue" represents those families of whom there were known to be children, but not how many.

ORTHODOX SERBIANS LIVING IN TOWNS

COMPLETE FAMILIES, OF MOTHERS BORN BETWEEN 1800–84, IN WHICH ALL CHILDREN BORN ARE SAID TO BE KNOWN

TABLE II (A)

District and Town	Size of Family																						
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		M.	F.	Sex Unknown	Total Children	Percentage of Females
I. Serbia. Pirot										1						1			22	2			48·8
II. (1) Sandjak. Novi Pazar	6	3	1	6		2	4	3	3	1	1		1	1					66	70	10		
Novi Varoš							1								1				7	8	5		
Sjenica	4	2	2	4	3		3	1	3	1			3						66	44	14		
(2) Old Serbia. Prizren								1		1									2	7	7		
Kosovo Polje Priština, Giljan, etc.	5	3	7	3	6	5	5	1	3	9	4	5	10	1			1		185	201	75		
Janjevo																			—	—			
Total	15	8	10	13	9	7	13	6	9	13	5	5	14	2	1	1	1	=132	348	332	111	791	
Average number of children, 5·9. Standard deviation, 4·2.																							
III. Macedonia, Tetovo, Skoplje, etc.	3		5	3	5	4	8	7	3		2	1	1	1					123	90	23		43·3
Debar										1									7	2			
Prilep									1										4	4			
Kruševo	1	2								1	1								8	13			
Kavedar	1	1	1	1	3	1		1					2		1				37	24	7		
Valandovo						1		1		1				1					17	14	3		
Ohrid			1		1														2	4			
Total	5	3	7	4	9	6	8	9	4	3	3	1	3	2	1			= 68	198	151	33	382	
Average number of children, 5·6. Standard deviation, 3·5.																							
IV. (1) Bosnia. Sarajevo		1																	1				
(2) Hercegovina. Trebinge	2	1	1	2								1							12	7	1		
Total	2	2	1	2								1						= 8	13	7	1	21	

N.B.—These few families of IV not included in these calculations

INCOMPLETE FAMILIES OR FAMILIES +, OF MOTHERS BORN BETWEEN 1800–84, IN WHICH MORE CHILDREN ARE KNOWN TO HAVE BEEN BORN THAN HAVE BEEN REMEMBERED

TABLE II (B)

District and Town	Size of Family																		Issue	M.	F.	Sex Unknown	Total Children +	Percentage of Females
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16							
I. SERBIA. Pirot																				—	—			41·5
II. (1) SANDJAK. Novi Pazar		5	7	3	1	1	1	1											1	29	20	1		
Novi Varoš		1																			1			
Sjenica		4	4	3		2	2		2											39	16	4		
(2) OLD SERBIA. Prizren		2	2	1																5	4			
Kosovo Polje { Priština, Giljan, etc.		4	6	9	3	5	6	3	1				1						3	77	62	18		
Janjevo								1												2	5			
Total		16	19	16	4	8	9	5	3				1					=81	4	152	108	23	283	
Average number of children, 3·5. Standard deviation, 2·3.																								
III. MACEDONIA. Tetovo, Skoplje, etc.		23	14	9	5	7	3			1									2	101	57	2		37·4
Debar		3																		2	1			
Prilep			1	1	1															7	2			
Kruševo		3	1	1		1														7	4	1		
Kavedar		4																		3	1			
Valandovo																				—	—			
Ohrid		1								1										2	8			
Total		34	16	11	6	8	3			2								=80	2	122	73	3	199	
Average number of children, 2·5. Standard deviation, 1·8.																								
IV. (1) BOSNIA. Sarajevo			1	1	1	1														7	7			
(2) HERCEGOVINA. Trebinge		1		1	1														1	5	3			
Total		1	1	2	2	1												= 8	1	12	10	22		

There were seven married couples who were known to have had children, but no details known. These are marked "Issue."

PIROT DISTRICT OF SERBIA (I)

COMPLETE FAMILIES: MOTHERS BORN 1800–84

CHILDREN DIED, 0–2 YEARS

TABLE III (A)

"CLEAN" MOUNTAIN VILLAGES

Numbers Died 0–2 Years	Size of Family													
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	
0		2	6	8	3	2	4	2	1					
1				1	1	1	1		2					
2				1		2	1			2				
3							1	3		2	1	1		
4								1	1	1		1		
5												1		
6										1				
7														
8														
9														
10				**3**	**1**	**5**	**6**	**13**	**6**	**20**	**3**	**12**		**69 total**
11														
12														
Total No. families		2	6	10	4	5	7	6	4	6	1	3	=	54

Total number of children born = 298.

TABLE III (B)

"SYPHILIS" MOUNTAIN VILLAGES

Numbers Died 0–2 Years	Size of Family													
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	
0		4	2	5	3	1	4	3	2	1	1			
1					3	3		1		1	1			
2							1	1	1		1			
3								1	2				1	
4							1							
5											1			
6														
7													1	
8														
9														
10					**3**	**3**	**6**	**6**	**8**	**1**	**8**		**10**	**45 total**
11														
12														
Total No. families		4	2	5	6	4	6	6	5	2	4		2	=46

Total number of children born = 267.

Children Died, 2–11 Years Old

Numbers Died Aged 2–11 Years	Size of Family													
	0	1	2	3	4	5	6	7	8	9	10	11	12	
0		1	3	6		4	2	4		2		2		
1		1	1	3	1	1	2		1	2				
2			2		2		2	1	3	1				
3				1	1		1	1		1		1		
4											1			
		1	5	6	8	1	9	5	7	7	4	3		56 total

Numbers Died Aged 2–11 Years	Size of Family													
	0	1	2	3	4	5	6	7	8	9	10	11	12	
0		3	2	5	4	2	4	2	4	1	2		1	
1		1		2	1		1	3						
2					1	1	1	1						
3						1			1	1	1		1	
4											1			
		1		2	3	5	3	5	3	3	7		3	35 total

Children Died, 12 Years Old and Over (Unmarried)

Numbers Died, 12 Years and Over (Unmarried)	Size of Family													
	0	1	2	3	4	5	6	7	8	9	10	11	12	
0		2	5	7	2	2	4	5	3	6	1	3		
1			1	3	2	1	2	1						
2						1			1					
3						1	1							
4														
			1	3	2	6	5	1	2					20 total

Numbers Died, 12 Years and Over (Unmarried)	Size of Family													
	0	1	2	3	4	5	6	7	8	9	10	11	12	
0		4	1	5	4	4	6	5	5	1	4		1	
1					1								1	
2			1		1									
3														
4								1		1				
			2		3			4		4			1	14 total

PIROT DISTRICT OF SERBIA (I)—COMPLETE FAMILIES: MOTHERS BORN 1800–84 (*continued*)

TABLE III (A)—"CLEAN" MOUNTAIN VILLAGES

TABLE III (B)—"SYPHILIS" MOUNTAIN VILLAGES

CHILDREN LIVED TO MARRY

TABLE III (A)

Numbers Lived to Marry	Size of Family 0	1	2	3	4	5	6	7	8	9	10	11	12
0		2	4	4	I		I						
1			2	2	I	2	I	I		I			
2				4	2	I	I	2	I	I	I		
3						2	3		2	2		I	
4							I	3	I	I		I	
5										I			
6												I	
7													
8													
9													
10													
			2	10	5	10	16	17	12	18	2	13	

145 B./Fd.

105 total

TABLE III (B)

Numbers Lived to Marry	Size of Family 0	1	2	3	4	5	6	7	8	9	10	11	12
0		I	I	3	2								
1		3		I	2	I	2	I	2				
2			I	I	I	3	2						I
3					I		I	I	I	I	2		
4							I	2	2	I	I		
5								2					I
6													
7													
8													
9													
10											I		
		3	2	3	7	7	13	22	13	7	20		7

94 B./Fd.

106 total

CHILDREN ALIVE IN 1931 (UNMARRIED)

TABLE III (A)

Numbers Alive in 1931 (Unmarried)	Size of Family 0	1	2	3	4	5	6	7	8	9	10	11	12
0		I	3	6	4	4	3	3	2	I			
1		I	2	I			2	I		3	I	2	
2			I	2			2	I	I	I			
3				I		I		I	I			I	
4										I			
5													
6													
7													
		1	4	8		3	6	6	5	9	1	5	

48 total

TOTAL 298

TABLE III (B)

Numbers Alive in 1931 (Unmarried)	Size of Family 0	1	2	3	4	5	6	7	8	9	10	11	12
0		4	2		2	2	2	2		I	I		I
1				I	2			2	I		2		
2				3	I	2	I	2	2				I
3				I	I		I			I	I		
4							I		I				
5							I						
6													
7									I				
				10	7	4	14	6	16	3	5		2

67 total

TOTAL

CENSUS IN ANCIENT CHINA

By ROSWELL S. BRITTON, B.LIT., PH.D., *New York University*

POPULATION study of ancient China is desirable for many reasons, chiefly perhaps for light on the causation of the extraordinarily high density achieved by the Chinese people. A view of the larithmic situation in the opening epochs of history is a proper preface to the dynamics of that agrarian density, and has its own interests and its bearings on the cultural and political studies of the life of the times. Dated historical documents from 841 B.C. offer many glimpses of the population situation among the kingdoms of pre-imperial China, such as cases of census, community migrations, a few scattered figures for local populations, pronouncements of philosophers upon population matters, and a theory and some degree of practice of population registry in connection with general inventories of state resources. Recent archaeology is furnishing guide-posts for organizing the documentary materials and for retrojecting lines of development into the prehistoric times when the trend towards high density became determined. A fairly clear larithmic picture of ancient China can now be pieced together from a critical and detailed study of the documents in the light of archaeological data. This paper is concerned with only one of the mentioned items—the census.

There are trustworthy accounts of two cases of census, one in the Kingdom of Chou in 788 B.C., the other in the Kingdom of Ch'u in 589 B.C. Both cases were closely linked with war. But though they must be classed as military censuses, they seem to come more nearly to the conditions of census than do the population registries. The historians do not record any numerical results of either census, and this omission is typical of the non-statistical character of the Chinese mind, true throughout history. In general this rule may be taken, that the figures—which are a point of departure for modern population studies—must be among the conclusions of Chinese population studies. The two censuses are of interest, therefore, not for numbers but for light on the circumstances of census, particularly for the attitude of the early Chinese concerning the gathering of vital statistics. They exhibit an antagonism to census which is, broadly speaking, similar to census resistance common among other peoples of the world in early stages of civilization. But the circumstances of the census in Chou in 788 B.C. show also an approval of population registry as distinguished from abrupt census.

The dates of these censuses lie well within historic time. Ages before this, community life of a sedentary agricultural character had emerged among the folk who resettled the North China plains after the loess had been deposited. The semi-history of the four or five centuries preceding the ninth century B.C.—quite apart from the mass of myth and legend so often loosely mistaken for history—seems to show a large number of small agricultural town-states surrounded and interspersed by less advanced tribes. At the commencement of history, a process of absorption and amalgamation appears well under way, pointing to the imperial unification accomplished by the head of the Kingdom of Ch'in, who made himself First Emperor in 221 B.C. The kingdoms in which the censuses took place were both among the dozen or more relatively notable seigniories distributed over the loess and contiguous sandy lucastrine plains of the North and the alluvial valley of the Yangtze River. The major states were for all practical purposes independent, and were extending their sway over the smaller states clustered around them.

Certain of the more advanced of these states—not the largest, but those which were in the vanguard of Chinese civilization—produced the histories of the time, which show that, at least in these culturally leading communities, the population was divided sharply into two classes. This cleavage between nobility and peasant has long been known,[1] but only recently has archaeology provided its economic connotation.[2] The small class of aristocrats had a mature Bronze culture, which they had brought with them if they were invaders, or had somehow acquired if they were not invaders. The aristocrats jealously kept to themselves the benefits of the superior culture, and thereby dominated a peasantry far outnumbering them. The simple farmer folk went on living and tilling the fields after Neolithic ways, seemingly quite submissive to their masters. The distinction was less acute in several of the larger outlying states, whose rulers were less removed culturally from the level of the tribal folk of the hills and marshes and the outer wildernesses.

The Kingdom of Chou ranks in the orthodox Confucian tradition as the imperial kingdom, and so gives the name Chou Dynasty to the epoch conventionally dated 1122–255 B.C. But the Chou had a relatively small domain, as among the major states, and, certainly from 841 B.C., was manifestly weaker than many of them, and did not rule any manner of empire or constitute an imperial dynasty in the sense of the later Ch'in and Han. Nevertheless the Chou seems to have possessed a certain religious or ceremonial priority among the most advanced states. The actual basis of this priority is still a problem for sinology. The census in Chou was taken by King Hsüan, who reigned 827–782 B.C. Though relatively long, the reign was marked by neglect of domestic duties, violence, ill-judged policies, conflict with other states, defeat, and general decline. The census is dated in a terse entry in *The Bamboo Annals*:[3]

> In his fortieth reign-year, King Hsüan
> took a census of the people at T'ai Yuan.

The location of this T'ai Yuan is uncertain, and therefore also its extent. T'ai Yuan means Great Plain, and the words appropriately have served as a place-name for several localities on the fertile loess plains of North China, and remain attached to many places, including the capital of Shansi province, which, however, can scarcely be the census locus. The Chinese commentators disagree, but tend to place the T'ai Yuan of the census to the north-west of the Chou capital, so far even as the Kuyuan and Chenyuan departments in modern Kansu. Many Chinese reference books are content to define this T'ai Yuan as "the place where King Hsüan of Chou took the census." There is a hint in the historical context that the census was taken in a thickly inhabited area lying north or north-west of the Chou capital of that time, known as the western capital of Chou, at Hao, located somewhat westward of the present capital, Sianfu of Shensi province. There would seem no objection to taking the loess tableland on the north of the Wei River in modern Shensi as the census locus. This loess land, like similar flats in Kansu and Shansi, no doubt then supported relatively dense populations, as now. But the census place and its area remain conjectural.

Ssu-ma-Ch'ien, the great historian of early China, born 145 B.C., records the census in his Shih Chi,[4] and adds an objection made by the King's minister, Chung Shan-fu, a worthy whose merits are celebrated in an ode preserved in the Classic of Poetry.[5] This is a translation of the Shih Chi passage in full within bounding dates:

> In his thirty-ninth reign-year [= 789 B.C.] there was a battle at Ch'ien Mou. The royal army was utterly routed by the Chiang clan of the Jung [Western barbarians]. King Hsüan, having lost his army in the southern states,[6] proceeded to take a census of the people at T'ai Yuan. Chung

Shan-fu remonstrated, saying: "The people should not be censused." King Hsüan did not heed, and did take a census of the people. In his forty-sixth reign-year [= 782 B.C.] King Hsüan died.

On philological grounds it may be inferred that the census was limited to the common folk. The character *min*, the masses, would refer to the peasantry and the labourers, the Neolithic under-society. This inference tallies with the general situation. The nobility rode chariots to war and fought in a manner somewhat suggestive of medieval European chivalry. The common folk composing the infantry and labour corps had to do the meaner part of the fighting; and they and their families had to produce the wealth that paid the costs of war. The aristocratic minority would be more or less one with the King and his ministers and generals who resolved upon war, while the commoners, to be conscripted to bear the brunt of war, would be the element requiring military census. The commoners would naturally hate war and the census incidental to it. The odium would not infect the nobility, and only a relatively enlightened minister, such as Chung Shan-fu, who must have been fully conscious of the position of the peasantry as the foundation of the state's wealth and power, would recognize the necessity of respecting the popular resentment against census.

A third source, the Kuo Yü,[7] of unknown authorship, supplies an address detailing Chung Shan-fu's remonstrance against the census, and also appends a note of retributive consequences which descended upon the line of the unheeding king. The modern text of the Kuo Yü appears to be fragments of a large historical work composed perhaps about the third century B.C., possibly earlier in parts. The address of remonstrance comes under the suspicion appropriate to all speeches attributed in early histories to earlier orators. The unknown author of the Kuo Yü scarcely made this address out of whole cloth for Chung Shan-fu, but most likely did amplify from records available to him and since lost. But this at worst alters the case for present purposes only in leaving a question whether the specific objections to census, as stated in the speech, are the thoughts of Chung Shan-fu of the eighth century B.C., or the thoughts of a writer of a later but still ancient century. There can be no reasonable doubt that the royal counsellor did remonstrate with his king at the time when the King undertook the census. Following is a rather literal translation[8] of the Kuo Yü account:

King Hsüan, having lost his army in the southern states, proceeded to take a census of the people at T'ai Yuan. Chung Shan-fu remonstrated, saying:

"The people should not be censused. The ancients, without taking census of the people, yet knew their number. The Minister of the People[9] attended to orphans and to deaths. The Minister of *Shang*[10] attended to the masses and the aristocratic clans. The Minister of Infantry attended to troop mobilization.[11] The Minister over Criminals attended to the vicious.[12] The Herds [Officers] attended to the sacrificial animals. The Crafts [Officers] attended to the tanning of hides. The Fields [Officers] attended to income [i.e. the grain levies]. The Grange [Officers] attended to disbursements. Thus it was that numbers, deaths and births, income and disbursements, going and coming, all could be known.

"By these [following royal functions] the numbers also may be examined for the purpose [of census]. The King rules over agriculture by the Recording [of Tillage Allotments[13]]. The Spring Hunt[14] comes at an interval in agricultural labour. The cultivation of the crops also [then proceeds] in conformity with the Record [of Tillage Allotments]. The Autumn Hunt comes when the harvest has been reaped. The Winter Hunt comes at the time of completion [of all field labours]. All these [seasonal administrative duties] are means of keeping count of the people. Why, then, take a census?

"If one does not speak of the fewness [of his subjects] but yet makes a great census thereof, he exhibits not only the fewness[15] but also his distaste for his proper duties. In governing, if one reveals a fewness, the princes will become alienated. In ruling his people, if one dislikes his proper duties, he cannot impose tribute and maintain his authority.

"Moreover, to make a census of the people without cause is a grievance to Heaven, bringing down calamity upon government and also ill-fortune upon the royal successor."

The King did take the census, and in consequence King Yü [his successor] was defeated and extinguished.

This vigorous and reasoned objection is not to the ruler's knowing the numbers of his subjects but to a census such as the King proposed and carried out. Indeed, according to this speech the King should know his vital statistics thoroughly, and would if he himself had been duly discharging his royal duties and having his ministers functioning properly, according to an ancient pattern of government which is here no doubt idealized and in part quite utopian. The appeal to antiquity is of course typical of Chinese argument, from earliest times down to the present. One minister particularly would know the current gain and loss by births and deaths; another would seem to have some sort of classified register of both the subject-masses and the nobility; another would know the resources in foot-soldiers; and another would know particularly of the criminals. Minor officials of four classes would know the livestock and tax-grain resources. All together, if functioning ideally as in some perhaps wholly imaginary Golden Age of the past, would maintain a running inventory of the state's resources, human and animal and cereal. This is an instance of the theory of population registry, and in this case clearly the theory was not in practice, else the census would have been unnecessary.

The address, then, turning pointedly upon the King himself, refers first to the *chi-t'ien*, an administrative ritual duty at the commencement of the agricultural season, obviously of transcendant importance in an agrarian community, as an invocation for a bountiful year and as a practical stimulus to the same end. The *chi-t'ien* is commonly translated Ploughing Ceremony, and no doubt a royal labour of ploughing a holy temple field was a part of the business in early times.[16] The ritual became a fixture in Chinese tradition, practised by all but renegade emperors down through the dynasties until the fall of the last in 1912. But in the early times, in the small kingdoms, the practical business of supervising agriculture was probably quite as much the concern of the kings and lesser seigniors as the ritual aspect. The term *chi-t'ien* means literally Recording the Fields, and refers no doubt to the selection and allotment of fields to the farmer families. A survey of the arable land was necessary at the opening of each season, under the system existing in Chou and in kindred early states. The peasants did not own the farm land, and were not even permanently allocated.[17] The land of the kingdom or seigniory belonged to king or seignior. Tillage in small subdivisions was allotted to the farmers anew at each season, according to circumstances, some lands being left fallow, or perhaps even unploughed, to recuperate. The peasants lived in villages in winter and in spring moved to temporary huts in the fields. The first ploughing, apparently, was done more or less in common. After the ploughing, at the interval designated in the address as the Spring Hunt, the fallow ground would be alloted to families to plant and cultivate and harvest that one season's crop. Thus the King, by means of the record or registration of tillage allotments, kept his hand of authority closely upon agriculture, which was the material source of his wealth and power. The histories record that earlier in his reign King Hsüan had neglected the *chi-t'ien*.

The royal duty in regard to agriculture at the time of the Autumn Hunt would be the inspection of the harvest, the "tasting of the grains," a function which also in ritual continued in China and was carried over to Japan, where in later centuries it was diversified in a numerous series of fantastic ceremonies. The royal duty at the time of the Winter Hunt would relate to the official supervision of the retreat from the temporary warm-weather huts at the farm sites, when the peasants retired into winter quarters and marriages among the young people were confirmed. These and other activities offered routine occasion for an official check upon population. The mention of these matters in the address is a rebuke to the King, who had been neglecting some if not all of them. The passage would seem to say that these matters alone, if duly observed, would obviate the census—quite apart from the proper functioning of the four ministers.

The address, turning next upon political expediency, warns the King of a double risk in venturing to take the census, a risk in revealing the supposedly depleted number of his subject population, and a risk in revealing his dereliction in royal duties. The one would jeopardize his prestige among the other princes, the other his power to levy tribute upon his subjects and to exercise authority in general.

The address concludes with two brief warnings of a superstitious quality. They make a rhetorical finish to the speech, but both, and especially the second threat, have the ring of retrojected prophecy. Chung Shan-fu could scarcely have uttered such prophetic warning, whereas a later speech-composer could scarcely have failed to take advantage, in some such manner, of the calamities which befell King Hsüan and his successor. The fortunes of Chou dwindled and fell in utter disaster. King Yü, who reigned 781–771 B.C., let barbarians overrun his kingdom in consequence, as the story goes, of fantastic efforts to bring a smile to the face of a grave but bewitching court beauty, Pao of Ssu. The Kingdom of Chou was broken for the time being, to be revived around a new capital near modern Honanfu, some two hundred miles east of the destroyed capital Hao.

Apart from questions of text, however, and considering the speech as it is, the supernatural note comes as a discord at the end of an argument which, however utopian in parts, is nevertheless on the whole sophisticated. Together with the reference to causeless census as a "grievance to Heaven," the force of the key-sentence, "The people should not be censused," may go for an indication of an old taboo against counting the people, such as, for instance, was encountered in 1926 among certain Kenya tribes. But the approval of population registry would indicate that the speech-maker (whether historian or Chung Shan-fu) was quite free from any superstition against counting. The speech as a whole would indicate less census superstition in ancient China than in modern China. Recent efforts[18] to gather vital statistics in Kiangsu province encountered fears of reporting births, especially of firstborn, and a belief that children's names and ages would be inscribed on foundations of a proposed bridge, causing measles and death. This last superstition points as much to the primitive custom of placing human sacrifice at foundations, perhaps, as to primitive census taboo. The same modern investigator met as well the realistic objection to census in the form of fear of recruitment for war on Japan (this was in 1932), and of fear of a new poll tax. These fears are essentially the same as those of the primitive peasants of ancient China, who, however, would seem more likely than the modern Chinese villagers to convert them into superstitious dreads.

Chung Shan-fu's objection to census in the Kuo Yü account is curiously like the objection of Joab, captain of the host, to the military census of Israel and Judah under King David. The Hebrew historians indicate their disapprobation of this census by ascribing it to the anger of the Lord in one account, and to Satan in the other account,[19] and by viewing the calamity of a pestilence as a retributive consequence. There is a conspicuous difference between the Chinese and Hebrew treatments of the retribution. The Jewish record makes much of the affliction of the people and the penitence of King David. The Chinese record has nothing of penitence of the King, or of what must have been severe suffering of the people of Chou in the few years following the census; but relates the aftermath just as it relates the warnings in terms of consequences upon the royal line. The Chinese did not have the Jewish sense of sin, nor a concern for the masses of the subject community.

The Kingdom of Ch'u,[20] where the military census in 589 B.C. was taken, was a large and powerful state occupying the middle Yangtze River valley, a vigorous if somewhat uncouth rival of the more sophisticated kingdoms of the northern plain. The northerners, more advanced in the arts and in civilized luxuries and vices, regarded the Yangtze valley folk as barbarians. It became the conventional thing to describe the kingship of Ch'u as a usurpation of a sole prerogative of Chou. The historians, being northerners, have probably handed down an unjust account of

Ch'u. The information on the census in Ch'u is much briefer than the Chou census, notwithstanding that the Ch'u census occurred two centuries later and must have been a far larger undertaking, apparently extending over the whole of the large Kingdom of Ch'u, whereas the Chou census seems to have been confined to one region of that small kingdom. The Ch'u census was taken by a prime minister, Tzu Chung, acting as regent, in the second reign-year of King Kung, who was then only twelve years old. This account occurs in the Tso Chuan[21] in a sequence of events leading to a great military offensive:

> On commencing to raise his army, Tzu Chung said:
>
> "Our sovereign is young, and we ministers are not the peers of the great ministers of former ages. Our army must be augmented before it can prevail. An Ode says:
>
> The officers were numerous;
> Thus was King Wen serene.[22]
>
> If King Wen required a large army, how much more so do we? Our late sovereign, King Chuang, in issuing a decree, once said:
>
> " 'If virtue does not reach to far regions [i.e. if a ruler's prestige does not prevail sufficiently], the best recourse is to be kindly compassionate to the people and to treat them well.' "
>
> Then he [Tzu Chung] made a great count of the households, suspended punishments, gave largesse to the aged and the solitary, succoured the distressed, and pardoned criminals. He completed an army of utmost size. The royal corps also mobilized. . . .

The link between census and recruitment is again obvious.[23] But the minister here is in the reverse of the position of Chung Shan-fu. Instead of remonstrating against the census, Tzu Chung is himself making it. There is no room in the brief account for any warning of the impropriety of census, if any lesser ministers did object. There is no matter of delinquency of government. Nevertheless the minister is represented as impelled to make apologies and to defend his action, which he does in typical Chinese manner on grounds of his own inadequacy. A recognition of extraordinary necessity is to be taken as implicit in the apologia. The amnesty and bounty were means of gaining popular acquiescence in the war preparations, but they point, along with the whole trend of the narrative, to the unpopularity of census. The method of this census, counting by households, was the method generally used in population surveys for general taxation purposes in the Chinese Empire.

This account agrees with the accounts of the Chou census of

T'ai Yuan in several general facts and implications. The census in both cases was in military setting, linked to recruitment for war, not for the mere maintenance of a peace-time standing army. Census was unpopular, not to say odious, and very naturally so in consequence of the military significance. Census, therefore, was undertaken only at some risk to the authority undertaking it; in one case the sequence was disaster, and in the other case compensatory benefits were dispensed, probably by the same functionaries who carried out the count. Military census appears to have been long known in ancient China, even in the eighth century, for neither case is represented as a novelty. On the other hand, such census was not of frequent occurrence. Unless it was quite rare, more than two instances should be on record. Census, either in the sense of periodic counts or in the sense of full enumerations of the total population, was not practised at that early time. The ancient historians all ignore the numerical results of the two cases which they do record, and in general evince little or no interest in population statistics as such. Figures are similarly absent in the meagre records of actual cases of population registry of the sort outlined in the Chung Shan-fu address.[24] The earliest general figures that have come down through trustworthy media, and can be criticized in light of the circumstances of their compilation and so can be turned to statistical account, are those for A.D. 2, under the Han Dynasty.

NOTES

1. Henri Maspero, *La Chine Antique*, Paris, 1927, pp. 107 ff.

2. C. W. Bishop, "The Rise of Civilization in China, with reference to its Geographical Aspects," *Geographical Review*, xxii. 617 ff., New York, October 1932. See pp. 626 ff.

3. *The Bamboo Annals:* Chu-shu Chi-nien, found in A.D 281 in a tomb dating *c.* 299 B.C. There is much question of the correctness of the modern text as a recension of the tomb find. Translations: Éd. Biot, *Journal Asiatique*, 3ème serie, xii. 537 ff., xiii. 381 ff., reference p. 400 (December 1841, May 1842); James Legge, *The Chinese Classics*, Hong-Kong, 1861–72, III, Prolegomena, pp. 108 ff., reference p. 156.

4. Shih Chi. Translations: Éd. Chavannes, *Les Mémoires Historiques de Se-ma Ts'ien*, Paris, 1895, etc., reference 1, 277–278; Herbert J. Allen, *Early Chinese History*, London, 1906, reference p. 105.

5. Shih Ching, 3 : 3 : 6. Translation: Legge, *Classics*, iv. 541 ff.

6. Or, "his army of his southern states," i.e. recruited from the southern parts of his domain.

7. Kuo Yü (= Narratives concerning the states), Part I. The census passage is abstracted in a translation of portions of the work by C. de Harlez, "Le Koue Yu," I° partie, *Journal Asiatique*, 9ème serie, ii. 373 ff.,

reference p. 397; iii. 5 ff. Paris, 1893, 1894; II° partie, printed separately, Louvain, 1895.

8. There is a defective rendering of the Chung Shan-fu speech, with both omissions and interpolations, in J. A. M. M. de Mailla, *Histoire Générale de la Chine*, Paris, 1777–80, ii. 42–43. This work purports to be a translation of the T'ung Chien Kang Mu, a revision by Chu Hsi (A.D. 1130–1200) of an earlier compilation by Ssu-ma Kuang, which contains the Kuo Yü census speech verbatim but for deletion of thirty-one characters represented in my translation by the passage, "If one does not speak . . . and maintain his authority." Then, although retaining the warning of Heaven's displeasure in the speech, the T'ung Chien Kang Mu deletes the Kuo Yü statement of the consequent defeat and extinction of King Yü. De Mailla's thirteen volumes remain the largest work on Chinese history in any Western language, and his loose use of his source materials still blots our general view of China.

9. Minister of the People: Ssu Min. The duties of this and the following functionaries, except the second (see note 10), are described in considerable detail, and patently in highly idealized terms, in the Chou Li (= Ritual of the Chou, i.e. the administrative institutes of the Kingdom of Chou), a work put into its present form during the Han Dynasty, although orthodoxly attributed to the early Chou period. Translation: Éd. Biot, *Le Tcheou li ou Rites des Tcheou*, 2 vols., Paris, 1851.

10. Ssu Shang. The character *Shang* (= Trade or Deliberation) seems to be used here for phonetic reasons rather than for its meaning, referring, according to the commentators, to a functionary who could judge names of suitable sound, apparently for both commoners and aristocrats. But the clause may be corrupt, and it is futile to labour the meaning. The trend of the passage is quite clear.

11. The common translation of Ssu T'u as Minister of Education is misleading. The character *T'u* (= footman, foot-soldier, follower, apprentice, disciple, pupil) must be taken here in the sense as used at this early time when there was no education of the masses except in the sense of drill for warfare. Maspero, op. cit.(1), p. 114, assigns to this minister a general responsibility for regulating everything for the common folk; but that wide duty would leave no room for differentiation from the Ssu Min,(9) and the reasonable as well as philologically valid distinction would be as here rendered.

12. A Chinese commentator explains that the Minister over Criminals (Ssu K'ou) would know the losses to population due to capital punishment.

13. The phraseology, as well as the tenor of context, points to the administrative routine as much as to the ceremonial business, which commonly is emphasized at the expense of the practical. See Maspero, op. cit.(1), p. 231.

14. The Hunts signify here, not hunts as such, but nodes in the annual cycle of activities, and imply the administrative ritual duty appropriate to each Hunt time.

15. Fewness of subjects = weakness of the State, both figuratively and philologically.

16. See note 13.

17. Maspero, op. cit.(1), pp. 108, 111.

18. "Notes of a Chinese Census Taker" (anonymous), *Asia Magazine*, New York, 1934, February, pp. 125 ff., March, pp. 186 ff.

19. Old Testament, 2 Samuel xxiv. 1, 1 Chronicles xxi. 1. The earlier

census of Israel, in the second year of the exodus, was quite as military as David's census, except that the Levites were also numbered under Moses and Aaron; but the record (Numbers i–iv) shows no condemnation, perhaps because at that time, in the wilderness, the people felt a necessity of military preparation such as the later generation could not feel in reference to King David's warring.

20. For a full history of this kingdom, see Albert Tschepe, "Histoire de Royaume de Tch'ou," *Variétés Sinologiques*, No. 22, Zi-ka-wei, Shanghai, 1903. The census is related at p. 108.

21. Tso Chuan (= Tso's Record or Commentary) the present form in which a large and early historical work has been cut and arranged to fit the Ch'un Ch'iu, a terse chronology of the Kingdom of Lu, orthodoxly attributed to Confucius. Translations: Legge, *Classics*(3), vol. v, in two books, reference part 1, p. 348; Seraphin Couvreur, *Tch'ouen Ts'iou et Tso Tchouan*, 3 vols., Ho Kien Fou, 1914, reference 2, 29–30. Both Legge and Couvreur follow the astronomical system of counting Annus Domini as a zero year, so that the year 589 B.C. appears in their works as 588 B.C.

22. From a classic ode. See Legge, *Classics*, iv. 429.

23. Marcel Granet, *La Civilization Chinoise*, Paris, 1921, p. 308 (translation, Innes and Brailsford, *Chinese Civilization*, London, 1930, p. 262), gives a military interpretation not only to this census but also to a case of general survey or inventory of the state's resources in the same kingdom in 548 B.C. Professor Granet is contributing notably to the field of ancient Chinese history by sociological interpretation (according to the Durkheim school) of the early documentary data. The disturbance which his works have occasioned in sinological circles, both in China and in the West, and even among the modern critical extremists, is most wholesome.

24. The conventional quotation of a figure for the twenty-third century B.C. is wholly fatuous; and use of the familiar figure for the ninth or tenth century B.C. is almost equally so. The specifically dated figure for 683 B.C. can be traced only to late Han Dynasty documents, but a circumstantial case can be made in favour of taking it somewhat seriously.

THE EFFECT OF RURAL-URBAN MIGRATION UPON DEATH-RATES

By HAROLD F. DORN

THE question of the selectivity of the migration from rural regions to cities has interested scholars for many decades. The idea that the cities attract not only the most intelligent and enterprising of rural youth but also the most healthy prevails throughout much of the voluminous literature that has accumulated on the subject. The absence of accurate and reliable statistics has proved no handicap to the development of theories; indeed the abundance of speculation concerning this problem bears eloquent testimony that the depressing influence of statistics has been successfully avoided.*

Among the evidence which has been adduced in support of the statement that the more healthy rural youth migrate to the cities in disproportionate numbers is the fact that in certain areas the specific death-rates in early adult life are lower in urban than in rural regions, while the death-rates at other ages are lower in the rural than in the urban population. This was pointed out by Welton many years ago when he examined the mortality statistics for London and the surrounding territory. His contention was that migration deprived the rural districts of the strongest and most healthy persons, and that among the migrants from the city to country were a certain number of rural emigrants who had lost their health in the city as well as a number of sick persons born in town, but moving to the country in search of healthier conditions. The net effect of this selection was to increase the mortality-rates in rural regions so that at about 20 to 30 years of age there were relatively more deaths among the rural population.†

The Registrar-General of England and Wales has also called attention to the existence of excess rural mortality in young adult life.‡ It has been noticed for several years that the mortality-rates for the population of London have been greater than the corresponding rates for the population of the surrounding rural areas with the exception of the rates at about 20 to 30 years of age as a rule. In the reports on mortality it has been suggested that this difference may be due very likely to the effects of selective migration.

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* For a summary and criticism of the literature, see P. A. Sorokin, C. C. Zimmerman, and C. J. Galpin, *A Systematic Source Book in Rural Sociology*, Chapter XXII, 1932.

† T. A. Welton, "The Effects of Migration in Disturbing Local Rates of Mortality as Exemplified in the Statistics of London and the Surrounding Country for the Years 1851–60," *Journal of the Institute of Actuaries*, 1870–72, Vol. XVI, pp. 153–186.

T. A. Welton, "The Effect of Migration upon Death-Rates," *Journal of the Royal Statistical Society*, 1875, Vol. XXXVIII, pp. 324–334.

‡ *Seventy-fourth Annual Report of the Registrar-General of Births, Deaths, and Marriages in England and Wales*, London, 1911, pp. xlix–lii.

Two of the most careful and thorough of modern studies are those of Hill in England and Livi in Italy.* Interestingly enough these two investigators did not come to the same conclusions concerning the effects of migration.

At the suggestion of the Industrial Health Statistics Committee and with the assistance of the Medical Research Council, A. B. Hill conducted an investigation of the effects of migration in the rural districts of the county of Essex. Although the evidence was rather circumstantial, after a careful analysis of the data concerning mortality, migration, diet, housing, and the after-history of migrants, Hill concluded that not only is it the stronger element that tends to migrate, the weaker element that tends to stay in the country, but that this stronger element secures a higher economic position in the towns, while the weaker element in the country is subjected to worse housing conditions and to a less nutritious diet. While a few of the migrants return home to die, the greater part of the excess in the rural death-rate in early adult life is probably due to a population weakened by selection succumbing to disease which the general conditions of life do not assist in overcoming.

On the other hand Livi, although he was studying more specifically transatlantic migration, discovered that provinces with considerable migration showed a vitality and mortality not worse than the provinces with an insignificant or no migration. He also gave some evidence showing that among the rural emigrants who return to their former homes the proportion of diseased and weak persons is very high. It must be concluded that the available evidence concerning the selective effect of rural emigration is contradictory, and that the problem is far from being solved.

Some additional information relative to this matter was discovered in a study of differential rural-urban mortality in the State of Ohio, U.S.A. In co-operation with the Scripps Foundation for Research in Population Problems and the Division of Vital Statistics of Ohio, the 76,000 death records for 1930 were searched for non-resident deaths, and the data tabulated by residence of the deceased. Since the results of the effect of allocating non-resident deaths have been discussed elsewhere, no further mention of this will be made here. All rates subsequently used are based upon resident deaths.*

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* Livio Livi, "Emigrazione ed Eugenetica," *Atti del Primo Congresso Italiano di Eugenetica Sociale*, 1924.

A. B. Hill, "Internal Migration and Its Effects upon the Death Rates," Medical Research Council, Special Report, Series No. 95, 1925.

TABLE I

MALES PER 100 FEMALES IN THE NATIVE WHITE POPULATION, BY AGE, RURAL AND URBAN, OHIO, 1930*

Age	Rural	Urban
0–4	105	103
5–9	105	102
10–14	106	100
15–19	113	92
20–24	114	92
25–29	104	96
30–34	102	98
35–44	104	99
45–54	108	97
55–64	114	92
65–74	116	81
75 +	104	70
All ages ..	108	96

* Fifteenth Census of the United States, 1930.

In many respects the state of Ohio with its 6,646,000 population in 1930 is a suitable area in which to study rural migration. The north-eastern part of the state lies within the important rubber and steel industrial area of the United States, while the western part adjoins the fertile agricultural region of the middle west. Although migration from rural areas has been evident in Ohio for more than fifty years, it has been particularly prevalent during the industrial expansion of the past two decades. About 60 per cent. of the 887,000 increase in population in the state between

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* Harold F. Dorn, "The Effect of Allocation of Non-resident Deaths upon Official Mortality Statistics," *Journal of the American Statistical Association*, 1932, Vol. XXVII, No. 180, pp. 401–412.

1920 and 1930 was due to excess of births over deaths and about 40 per cent. to net migration. Since the foreign-born white population declined in number during this period, the increase due to migration was the result of the movement of native whites and negroes into Ohio. Many of these migrants came from the agricultural regions of the south and settled in the rapidly growing industrial centres of the state.

In addition to the migration from outside the state, there was an extensive migration from the farms and small villages to the large urban centres. P. G. Beck, who made a careful analysis of the population changes in Ohio, estimated that more than 200,000 persons left Ohio farms between 1920 and 1930.* Although rural women bore 34 per cent. more children than urban women of the same age, the urban population increased 22·6 per cent., while the rural population increased but 2·7 per cent. during this period. Considering only the population over 15 years of age in order to eliminate changes in the birth-rate and applying survival-rates

TABLE II

PERCENTAGE AGE DISTRIBUTION OF THE NATIVE WHITE POPULATION, BY AGE AND SEX, RURAL AND URBAN, OHIO, 1930*

Age	Male		Female	
	Rural	Urban	Rural	Urban
0–4	9·7	9·7	10·0	9·1
5–9	11·1	10·6	11·3	10·0
10–14	10·8	10·1	11·0	9·7
15–19	9·8	9·2	9·3	9·6
20–24	7·6	9·5	7·1	9·9
25–29	6·2	8·6	6·4	8·6
30–34	6·0	7·9	6·4	7·7
35–44	11·8	14·0	12·3	13·6
45–54	10·5	10·0	10·5	9·9
55–64	8·5	6·2	8·1	6·5
65–74	5·7	3·2	5·3	3·8
75 +	2·4	1·1	2·5	1·5
Total ..	100·0	100·0	100·0	100·0

* Fifteenth Census of the United States, 1930.

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* P. G. Beck, "Recent Trends in the Rural Population of Ohio," Ohio Agricultural Experiment Station, Bulletin 533, May 1934.

to the respective age groups, Beck discovered that 32 per cent. of the males and 37 per cent. of the females between the ages of 15 and 35 left the farm for villages and cities or migrated to other states. The results of so extensive and widespread a movement is clearly shown in the age and sex distributions of the urban and rural populations.

Since more males than females are born and the mortality-rates for females are less than the mortality-rates for males, as a rule, we would expect, in a stable population, that the sex ratio would be highest at birth and would gradually decrease throughout life. Such, however, is not the case in Ohio. In the rural native white population there is a sudden rise in the sex ratio from ages 15 to 25 followed by a decrease to age 35, after which there is a gradual increase until 75 years of age, when the effect of differential mortality-rates bring about a sharp decrease again (see Fig. 1). The contrary is noticed in the urban native white population. While these changes may, in some part, be due to deliberate misstatement of their age by females, the major reason appears to be migration. The sharp rise after age 10 is very likely due to the migration of females from the farms to the cities. The migration of males begins somewhat later and counterbalances the movement of

FIG. 1

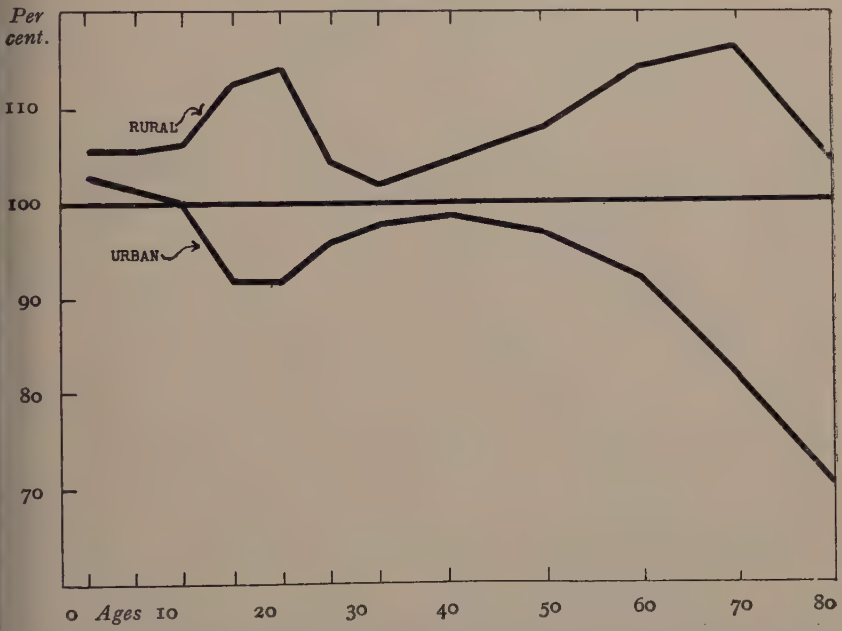
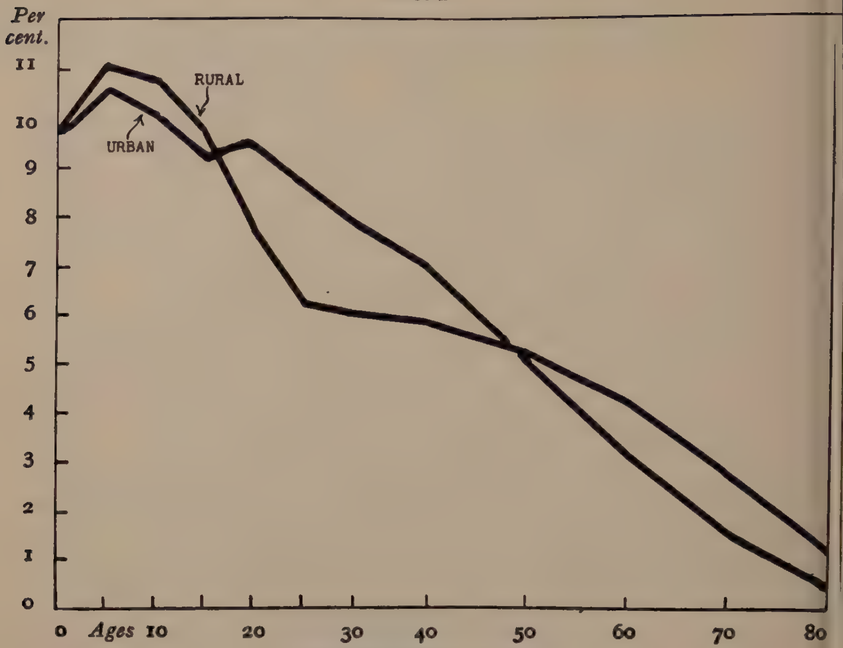
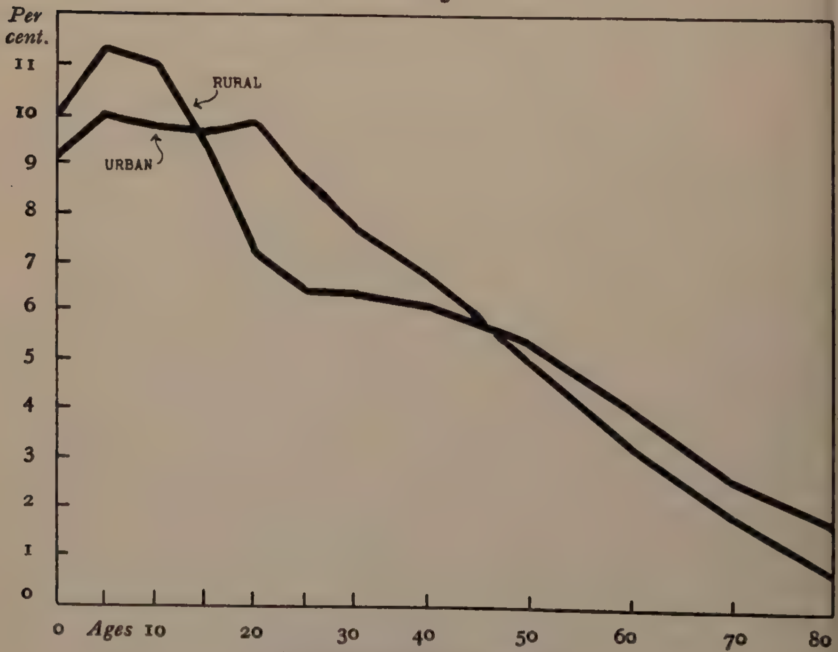


FIG. 2



Age Distribution—Males.

FIG. 3



Age Distribution—Females.

females at about 25 years of age, causing a decline in the sex ratio for the next ten years. The increase after age 35 is probably due to the movement of older females to villages and cities, possibly to live with their children or to eke out an existence as housekeepers or servants.

The influence of migration is just as noticeable in the age distribution of the rural and urban native white populations.

TABLE III

DEATH-RATES PER 1,000 NATIVE WHITE POPULATION, BY AGE AND SEX, RURAL AND URBAN, OHIO, 1930[*]

Age	Male		Female	
	Rural	Urban	Rural	Urban
0–4	16·5	17·1	13·8	14·0
5–9	1·9	2·2	1·5	1·4
10–14	1·4	1·5	1·3	1·1
15–19	2·2	2·5	2·1	1·9
20–24	3·6	2·8	3·4	2·7
25–29	3·7	3·2	3·6	3·3
30–34	3·4	4·1	3·8	3·6
35–44	4·9	5·9	4·7	4·8
45–54	7·6	11·4	8·0	9·6
55–64	16·8	24·7	16·6	19·2
65–74	43·8	57·3	40·3	44·7
75 +	117·8	138·8	121·7	119·0
All ages ..	11·0	9·9	10·5	8·8
Adjusted rate [†]	8·7	10·4	8·3	8·6

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[*] See *Journal of the American Statistical Association*, Vol. XXVII, No. 180, pp. 401–412, for the number of deaths on which these rates are based.

[†] Based on the standard million of England and Wales, 1901.

Relative to the urban, the rural native white population has an excess of both males and females in early life, a large deficit in adult life, and an excess again in old age (see Figs. 2 and 3).

Surely if it is true that the cities attract the more healthy from the rural population, the mortality-rates in Ohio should offer supporting evidence not only because of the large number of migrants during the past decade but also because this migration has existed for a long period of years.

As shown in Table III, for native white males the urban death-rate was greater than the rural death-rate for all ages except 20 to 30 years, but for the native white females the rural rate was greater at ages 5 to 35 and at 75 years of age and over. While the urban crude-rate is less than the rural crude-rate, the opposite is true when allowance is made for differences in age composition as shown by the rates adjusted on the basis of the standard million population of England and Wales of 1901.

In another paper certain criteria of differential mortality were proposed and applied to these data.* The conclusions were that the rural mortality-rate in Ohio was significantly greater than the urban mortality-rate for both the native white males and females at ages 20 to 25, but that the urban rate was significantly greater than the rural rate at ages 35 years and over for the males and at ages 45 to 75 for the females. The evidence also indicates, but not conclusively, that the urban mortality-rate was greater than the rural mortality-rate for males at ages 30 to 35 years.

Taking into consideration differences in the sex composition of the rural and urban populations, it was shown that the urban rate was greater than the rural rate at ages 35 years and over, while the rural rate was greater than the urban rate for the age group 20 to 25. At the other ages the differences in the rates were not great enough to be regarded as statistically significant. The differences between the urban and rural rates were greater for males than for females at ages 45 years and over; the same was probably true for the age group 30 to 45, but the evidence was not conclusive.

In view of the superior medical facilities, inspection of food and water supplies and protection against communicable diseases, which are in general more characteristic of urban than of rural communities, it is not surprising that there should be little or no difference between the urban and rural mortality-rates during childhood and early adolescence. If, as is often supposed, living quarters are less healthful for a large part of the population, especially in the large cities, than in the country, that life in cities is more intense and subjects the individual to a greater nervous strain than life in the country, and, in addition, occupational hazards are greater in the city, then we would expect that the urban mortality-rates would be greater than the rural mortality-rates in late adult life and that this difference would be greater for males than for females. Then if we suppose, as many eminent scholars have, that the more healthy rural youth migrate to the cities in disproportionate numbers, we would expect that the rural mortality-rate would be slightly larger than the urban mortality-rate at ages 15 to 19, when migration begins, become significantly greater at ages 20 to 24, when migration is usually relatively greatest, and then gradually decrease until the urban rates become greater at about 30 to 35 years of age. Such, indeed, is the case.

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* Harold F. Dorn and Samuel A. Stouffer, "Criteria of Differential Mortality," *Journal of the American Statistical Association*, Vol. XXVIII, No. 184, 1933, pp. 402–413.

TABLE IV

DEATHS AND DEATH-RATES PER 100,000 NATIVE WHITE POPULATION FROM TUBERCULOSIS (ALL FORMS), BY AGE AND SEX, RURAL AND URBAN, OHIO, 1930*

Age	Rates				Number of Deaths			
	Male		Female		Male		Female	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
0–14	8	10	9	12	26	56	28	65
15–19	12	20	44	43	12	33	40	78
20–24	61	45	99	81	48	76	68	150
25–29	56	55	89	72	36	85	55	116
30–34	51	63	77	67	32	89	47	97
35–44	51	63	51	52	63	157	60	132
45–54	49	63	38	44	53	113	38	81
55–64	74	85	57	35	65	95	44	42
65–74	81	96	118	79	48	54	60	55
75 +	113	105	126	62	28	20	30	17
All ages . .	40	43	49	45	411	778	470	833
Adjusted rate	37	42	48	43	—	—	—	—

* Following customary procedure, mortality-rates for specific diseases will be reported per 100,000 population; but it should be observed that such rates are not accurate in the last digit if the base population is less than 100,000. The adjusted rates used in this paper are all based on the standard million population of England and Wales for 1901. All deaths are exclusive of institutional deaths.

Before concluding too hastily that the greater rural mortality at the ages when migration is the heaviest is due to urban selection of the more healthy, we should examine the causes of death which account for most of the mortality during these ages—tuberculosis, influenza, and pneumonia, accidents and puerperal causes—to determine which diseases are exacting a disproportionate toll from the rural population.

Hill in his study of the effect of migration on rural-urban mortality in England showed that part of the excess rural mortality at 20 to 30 years of age was due to deaths from tuberculosis. The data for Ohio tend to support this conclusion, but the differences are not great enough to be conclusive. For the males the urban rates are quite consistently greater than the rural rates except from 20 to 30 and over 75 years of age; almost without exception, however, the rates for the females are higher in the rural than in the urban population, with the difference probably statistically significant after age 55.

TABLE V

DEATHS AND DEATH-RATES PER 100,000 NATIVE WHITE POPULATION FROM INFLUENZA AND PNEUMONIA, BY AGE AND SEX, RURAL AND URBAN, OHIO, 1930

Age	Rates				Number of Deaths			
	Male		Female		Male		Female	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
0–4	283	270	238	236	286	473	230	401
5–14	16	15	13	13	37	55	29	47
15–24	16	19	18	16	29	64	29	57
25–34	36	30	24	17	45	89	29	52
35–44	34	51	31	28	42	128	37	72
45–54	57	80	60	47	62	144	60	86
55–64	101	141	116	100	89	158	90	122
65–74	274	338	288	278	162	191	146	194
75 +	954	986	1,236	879	237	186	294	240
All ages ..	95	83	98	68	989	1,488	944	1,271
Adjusted rate	82	89	80	70	—	—	—	—

With the exception of the age groups under 35 years where the differences are not great enough to be of any significance, the urban mortality-rates for males from influenza and pneumonia are consistently greater than the corresponding rural rates. The female mortality-rates from influenza and pneumonia show the same tendencies as did the rates from tuberculosis. In contrast to the rates for males, those for females tend to be uniformly greater in the rural than in the urban population, although the differences do not become particularly significant until after 75 years of age.

The data for deaths from accidental causes illustrate the fact that adjusted rates may be practically as misleading as crude rates, unless mortality conditions are uniformly worse at all ages in one population than in the other. In general, the rural rates are greater in youth and less in old age than the urban rates, the net effect of which is to make the adjusted rates identical. Our conclusion that on the average there is no difference in rural-urban mortality from accidental causes is true but misleading. Although the differences between the rural and urban rates in early adult life are hardly great enough to be statistically significant on the basis of the present sample, nevertheless they do suggest that deaths from accidental causes influence the higher rural mortality at those ages. After age 45, the urban rates appear to be definitely greater than the rural.

The very young rural mothers are subject either to greater

TABLE VI

DEATHS AND DEATH-RATES PER 100,000 NATIVE WHITE POPULATION FROM ACCIDENTAL CAUSES, BY AGE AND SEX, RURAL AND URBAN, OHIO, 1930

Age	Rates				Number of Deaths			
	Male		Female		Male		Female	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
0–4	103	91	94	87	104	159	91	148
5–14	57	64	35	21	129	239	76	79
15–24	126	92	34	24	227	308	54	87
25–34	112	91	27	17	141	268	33	53
35–44	136	115	24	26	167	287	28	66
45–54	117	142	39	45	128	254	39	84
55–64	146	221	41	81	129	247	32	99
65–74	241	303	169	226	142	171	86	158
75 +	584	876	836	956	145	167	199	261
All ages ..	126	117	66	55	1,312	2,100	638	1,035
Adjusted rate	118	118	55	54	—	—	—	—

hazards in childbearing or less effective medical aid, since a larger proportion of them succumb to the dangers of childbirth. However, after age 25 the incidence of maternal mortality becomes greater in the urban population and remains greater during the remainder of the childbearing period. It may be that the younger rural mothers do not seek hospital service to such an extent as the young urban mothers, so that their slightly higher mortality reflects lack of competent medical care and information.

It was observed that for tuberculosis, accidents, and puerperal causes the rural rates were greater than the urban rates in early adult life; but with the possible exception of the male mortality-rate from accidents, these differences were not great enough to be regarded as statistically significant on the basis of the present data. However, if the deaths from these causes should be pooled, the results might be significant. As shown by Tables VIII and IX, our hypothesis is correct. It is now evident that the difference between the rural and urban mortality-rates in early adult life may be largely explained by a difference in the relative mortality from tuberculosis and accidents, with the possible exception of female mortality at ages 20 to 25. If we exclude puerperal deaths in addition to those from tuberculosis and accidents, the net rural and urban female mortality-rates at ages 20 to 25 become 1·4 and 1·3 per 1,000 population respectively.

TABLE VII

PUERPERAL DEATHS AND DEATH-RATES PER 1,000 LIVE BIRTHS, RURAL AND URBAN, OHIO, 1930

Age	Rates		Deaths	
	Rural	Urban	Rural	Urban
10–19	4·4	3·3	19	25
20–24	4·1	3·5	42	74
25–29	4·6	5·1	40	86
30–39	6·3	8·5	67	135
40 +	12·3	17·3	22	29
All ages ..	5·3	5·5	190	349

Part of the excess rural male mortality from accidental causes may be explained as resulting from mining accidents. This is particularly true for 1930, when one of the worst mine explosions in the history of Ohio occurred in Athens County with 82 fatalities. But this explanation throws little light upon the excess rural female mortality from accidents. Part of the higher mortality both of rural males and females from accidental causes is due to a relatively larger number of deaths from automobile accidents; but even excluding such deaths, the rural rates from accidents are still greater than the urban rates at the ages under discussion. It does not seem reasonable to attempt to explain this by an appeal to selective migration.

TABLE VIII

DEATH-RATES PER 100,000 NATIVE WHITE POPULATION FROM TUBERCULOSIS AND ACCIDENTS, BY AGE AND SEX, RURAL AND URBAN, OHIO, 1930

Age	Male		Female	
	Rural	Urban	Rural	Urban
15–19	111	94	78	67
20–24	222	154	134	105
25–29	188	139	114	93
30–34	143	160	106	81

TABLE IX

DEATH-RATES PER 1,000 NATIVE WHITE POPULATION FROM ALL DEATHS EXCLUSIVE OF DEATHS FROM TUBERCULOSIS AND ACCIDENTS, BY AGE AND SEX, RURAL AND URBAN, OHIO, 1930

Age	Male		Female	
	Rural	Urban	Rural	Urban
15–19	1·1	1·5	1·3	1·2
20–24	1·4	1·3	2·0	1·7
25–29	1·8	1·9	2·4	2·4
30–34	1·9	2·5	2·7	2·8

Since a larger proportion of urban than of rural births probably occurs in hospitals, and urban mothers probably receive better medical care, it is not surprising that deaths from puerperal causes are lower in the city than in the country, particularly at the ages under 25 years when a large proportion of first births occur. While it is true that an increasing proportion of rural mothers are seeking medical care in hospitals, nevertheless for considerable numbers medical facilities are not readily available in Ohio.

A somewhat similar explanation may be made of the higher rural mortality from tuberculosis in early life. It may be that not only are incipient cases detected sooner in urban areas where medical facilities are more easily accessible, but that treatment is more prompt and effective and sanatorium care more frequently resorted to. It also seems reasonable that the campaign against tuberculosis which has reduced the mortality so remarkably in recent years has been more effective in urban than in rural areas. In many rural homes the patient is often placed on the porch or left in some room, not only to die a lingering death, but also to infect other members of the family. If this is true, we would expect that the rural rate would be greater than the urban rate in early life, but that the urban rate would be greater in the older age groups for the reason that, due to differences in treatment, rural people infected with tuberculosis would tend to die relatively soon while better treatment would tend to postpone deaths of urban people, spreading the incidence of deaths from tuberculosis over a greater age span.

TABLE X

DEATHS AND DEATH-RATES PER 100,000 NATIVE WHITE POPULATION FROM AUTOMOBILE ACCIDENTS, RURAL AND URBAN, OHIO, 1930

Age	Rates		Deaths	
	Rural	Urban	Rural	Urban
0–4	14	21	27	71
5–14	18	21	78	154
15–24	33	25	112	178
25–34	25	24	61	144
35–44	21	23	51	115
45–54	28	36	58	129
55–64	27	47	45	109
65–74	54	84	59	106
75 +	80	151	39	70
All ages ..	26	29	530	1,076
Adjusted rate ..	25	29	—	—

Inspection of the data shows that the male mortality fits into this theory very admirably, but that the female mortality is not so easily described. However, since the rural patient is most likely to be cared for by a female member of the family, it would seem that the latter is the more likely to become infected and contract the disease in turn. Then there is the possibility that daughters, who have migrated to the city and become infected with tuberculosis, may return home when they are no longer able to support themselves. In any case, it does not seem necessary to posit the theory that the more healthy migrate in disproportionate numbers to explain the higher rural mortality in early adult life. On the other hand, the explanation given above does not necessarily deny that there may be some truth in the theory.

TABLE XI

DEATHS AND DEATH-RATES PER 100,000 NATIVE WHITE POPULATION FROM CHILDREN'S DISEASES, BY AGE AND SEX, RURAL AND URBAN, OHIO, 1930*

Age	Rates				Deaths			
	Male		Female		Male		Female	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
1–4	73	61	51	49	60	86	40	68
0–4	103	77	89	60	104	135	86	102
5–14	14	16	13	14	31	60	28	50
15 +	2	2	4	2	16	23	25	28
All ages	15	12	14	10	151	218	139	180

* Measles, scarlet fever, whooping cough, and diphtheria.

The relative lack of proper medical care in rural areas is further illustrated by the deaths from children's diseases—measles, scarlet fever, whooping cough, and diphtheria—and infant mortality. At the ages under 5, where the incidence of these diseases is heaviest, the rates are higher in the rural population, although after 5 years of age there is no real difference.

It is not unexpected that the infant mortality-rate should be lower in urban than in rural communities. The decrease in infant mortality in recent years has been primarily due to fewer deaths from the relatively easily preventable causes, such as the children's diseases listed above, and diarrhoea and enteritis. Of the important causes of death in early infancy the rural rate is greater than the urban rate for all except those due to venereal diseases, premature birth, and birth injury. If the present conditions continue, it will be a definite handicap from the point of view of surviving through infancy to be born in a rural community.

For the important diseases of late adult life and old age, especially for those against which medical care has been much less effective, the rural mortality-rates tend to be quite definitely lower than the corresponding urban rates. This is true for cancer, heart disease, diabetes mellitus, and nephritis and other diseases of the kidneys. For these diseases there is little or no difference between the rural and urban rates in early life, but after about 45 years of age, with one or two exceptions, the urban rates are definitely greater than the corresponding rural rates. This difference, however, is larger for the males than for the females; the rural female rates tend to be equal to or even slightly, but not significantly, greater than the urban female rates in the younger age groups, showing that rural and urban mortality is much more similar for females than for males.

TABLE XII

INFANT DEATHS AND DEATHS PER 1,000 LIVE WHITE BIRTHS FOR SELECTED CAUSES OF DEATH, RURAL AND URBAN, OHIO, 1930

Cause of Death	Rates		Deaths	
	Rural	Urban	Rural	Urban
Diphtheria, scarlet fever, measles, and whooping cough	2·4	1·1	90	83
Influenza and pneumonia ..	9·3	8·2	347	608
Syphilis and gonorrhoea	0·6	0·8	23	59
Diarrhoea and enteritis	7·7	6·8	284	501
Congenital malformation	6·6	6·4	246	471
Premature birth	15·9	17·8	588	1,314
Birth injury	4·0	5·2	148	383
Other diseases of early infancy ..	5·8	3·6	215	266
Accidents	2·1	1·5	78	108
Other causes	6·5	5·9	242	439
Total	61·0	57·2	2,261	4,232

The urban mortality-rates are also somewhat greater for certain minor diseases, for which data will not be presented here—venereal diseases, arteriosclerosis, diseases of the liver and gall bladder, appendicitis, diseases of the stomach and intestines, and homicide. There was practically no difference between the rates from cerebral haemorrhage and suicide in rural and urban communities.

We may conclude that, as a whole, urban mortality is significantly greater than rural mortality, but that this difference is not uniform throughout life. At the very young ages there is little or no difference, in early adult life the rural rates are significantly greater, while the urban rates are greater in late adult life and old age. For nearly every specific cause of death there is little difference between urban and rural mortality-rates in early life, although in certain instances the rural rates are slightly, but not significantly, greater.

TABLE XIII

DEATHS AND DEATH-RATES PER 100,000 NATIVE WHITE POPULATION FROM CANCER (ALL FORMS), BY AGE AND SEX, RURAL AND URBAN, 1930

Age	Rates				Deaths			
	Male		Female		Male		Female	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
0–24	3	4	2	4	13	35	11	35
25–34	12	7	15	23	15	20	18	69
35–44	27	30	67	78	33	76	79	197
45–54	67	100	180	222	73	179	181	411
55–64	207	273	330	428	183	305	256	521
65–74	544	714	544	720	321	403	276	503
75 +	926	1,222	1,122	1,032	230	233	267	282
All ages ..	84	70	113	108	868	1,251	1,088	2,018
Adjusted rate	55	72	81	99	—	—	—	—

While many people have chosen to interpret the higher rural mortality-rates in early adult life as being the direct result of selective migration, it seems reasonable to attribute a considerable part, if not all, of this excess mortality to lack of medical care and attention. For certain diseases against which medical campaigns have been vigorously waged in recent years—tuberculosis, puerperal diseases, diseases of infancy, and children's diseases such as whooping cough, scarlet fever, measles, diphtheria—the rural mortality-rates tend to be greater than the corresponding urban mortality-rates. On the other hand, for those diseases against which medical protection has been least effective, the rural death-rates are lower than the urban death-rates. From this it seems evident that the natural health advantages of the country —fresh air, outdoor life, less hazardous occupation, and possibly better food and housing—are being offset by the superior medical attention and facilities of the city.

TABLE XIV

DEATHS AND DEATH-RATES PER 100,000 NATIVE WHITE POPULATION FROM HEART DISEASE (ALL FORMS), BY AGE AND SEX, RURAL AND URBAN, OHIO, 1930

Age	Rates				Deaths			
	Male		Female		Male		Female	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
0–24	12	16	13	15	62	137	61	135
25–34	25	41	34	32	32	122	42	97
35–44	54	95	50	67	66	238	59	169
45–54	130	262	133	194	142	469	134	358
55–64	404	616	356	410	357	689	276	499
65–74	1,257	1,671	1,062	1,169	742	943	539	816
75 +	3,495	4,297	3,405	3,577	868	819	810	977
All ages ..	218	190	199	163	2,269	3,417	1,921	3,051
Adjusted rate	142	200	133	150	—	—	—	—

The situation may be summed up somewhat as follows. Since the greatest reductions in mortality in recent years have been in those diseases of infancy, childhood, and adolescence against which medical protection has been particularly effective, and since this protection is probably more effective in urban than in rural areas, it is to be expected that the rural mortality-rates should be approximately equal to or even greater than the urban mortality-rates for certain ages in the early years of life. This means that, proportionately, a greater number of urban weaklings, who ordinarily would succumb to childhood diseases, are protected in early life only to become more easy victims to the diseases of adult life against which medical care has been less efficacious. On the other hand, such persons in rural regions, due to inferior medical attention, die at an early age, increasing the rural death-rate during childhood and early adult life. But because the weaker are eliminated in early life, the rural adult mortality-rates tend to be lower than the urban adult mortality-rates. Additional factors tending to cause this differential are the more healthy environment of rural regions and the greater occupational hazards of city workers.

TABLE XV

DEATHS AND DEATH-RATES PER 100,000 NATIVE WHITE POPULATION FROM DIABETES MELLITUS, BY AGE AND SEX, RURAL AND URBAN, OHIO, 1930

Age	Rates				Deaths			
	Male		Female		Male		Female	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
0–34	3	3	3	3	20	34	17	31
35–44	4	8	10	9	5	20	12	23
45–54	14	19	25	32	15	34	25	60
55–64	37	64	86	99	33	72	67	121
65–74	80	159	152	186	47	90	77	130
75 +	105	163	113	223	26	31	27	61
All ages . .	14	16	23	23	146	281	225	426
Adjusted rate	10	16	17	20	—	—	—	—

Of course this does not necessarily deny that selective migration does play a part in causing the higher rural mortality in early adult life. However, it does seem a little strange that the weaklings remaining in the country should begin to die in large enough numbers to affect markedly the death-rates at almost the very same time as their more healthy brothers and sisters leave for the city. One might expect, not that the weaklings would die immediately after the more healthy leave, but that the influence of selective migration would begin to be noticed some years after the ages when migration is heaviest and that it would be cumulative in effect so that the rural mortality-rates would become greater and greater in relation to the urban mortality-rates. But such is not the case, for the urban rates are uniformly greater in adult life. It might be assumed that the occupational hazards of urban life more than counterbalance the superior health of the rural migrants, but this feat of rationalization seems somewhat artificial. And then one should remember that farming is not an occupation to be engaged in by weaklings.

TABLE XVI

DEATHS AND DEATH-RATES PER 100,000 NATIVE WHITE POPULATION FROM NEPHRITIS AND OTHER DISEASES OF THE KIDNEYS, BY AGE AND SEX, RURAL AND URBAN, OHIO, 1930*

Age	Rates				Deaths			
	Male		Female		Male		Female	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
0–24	5	5	5	8	28	47	23	68
25–34	9	12	20	16	11	35	25	48
35–44	16	34	29	26	19	86	34	67
45–54	53	83	58	77	58	149	58	142
55–64	178	252	146	178	157	282	113	217
65–74	430	599	351	481	254	338	178	336
75 +	1,357	1,632	996	1,186	337	311	237	324
All ages ..	83	69	69	64	861	1,248	668	1,202
Adjusted rate	54	73	48	59	—	—	—	—

* International List numbers 130–133, 1929 revision.

It must be admitted that the question of whether or not the greater mortality-rates of rural young adults is due to the migration of the more healthy youths has not been settled by this or previous studies. The answer will probably be found, not in a single cause, but in a complex of factors of which migration is not the most important.

VOLKSWACHSTUM UND WIRTSCHAFT IN IHREN ALLGEMEINEN ZUSAMMENHÄNGEN

By PROFESSOR DR. P. MOMBERT

[IN this article Professor Mombert discusses the ways in which density and growth of population affect economic conditions. He opens with a reminder that an increase in population is only one factor in the economic life of a nation, and that, e.g., in a country of limited agricultural or commercial possibilities it is a source of embarrassment. The relationship between population and industrial life is not so much causal as functional, and an increase in the former is only accompanied by an advance in the latter in favourable conditions.

In modern times the rapidly increasing efficiency of industry has been due, not to a rise in population, which has indeed lagged behind, but to technical causes, to improved means of transport, and not least to the fact that modern improvements are easily transferable from one country to another. Thus the United States could not have developed so rapidly had they been unable to draw on the accumulated experience of Europe: the rise in population was by no means the chief factor in their development. It is true that a regular increase in population may release forces which make for favourable economic conditions, e.g. stimulating demand on the commodity market; but this demand is determined in the main by the purchasing power, not the size, of the population: there are dense populations with small purchasing power, and *vice versa*. Later, the writer proceeds to show that in our own time many of the phenomena of economic life are produced in a more conscious and controlled fashion than formerly, with a consequent disturbance of organic relationships; thus the post-war process of rationalization has no relation to the movement of population.

As for the future, and the possible effects in the civilized countries of the West of a decreasing population, Professor Mombert agrees with the author of *Standing Room Only* that this decrease will not act as a check to economic progress; he does not think that it need lead to a decrease in purchasing power.]

Es unterliegt keinem Zweifel, dass dem Wachstum der Volkszahl für die Entwicklung der Wirtschaft eine ganz erhebliche Bedeutung zukommt. Manche haben darin schon schlechthin die Ursache allen wirtschaftlichen Fortschrittes sehen wollen. Man wird jedoch eine solche Anschauung in zeitlicher wie in sachlicher Hinsicht nur mit recht grossen Einschränkungen gelten lassen können. Dass ein starkes Volkswachstum und eine grosse Volksdichte als allein treibender Faktor für die wirtschaftliche Entwicklung nicht gelten können, zeigen z.B. die Verhältnisse mancher ostasiatischer Völker, bei denen sich eine grosse Dichte der Bevölkerung ganz anders ausgewirkt hat, als in den Staaten Europas.

Demnach müssen noch andere Faktoren wirksam sein, die neben der Stärke des Volkswachstums als Triebkraft für den Gang der wirtschaftlichen Entwicklung am Werke sind. Diese anderen Faktoren liegen einmal in der Natur des Menschen selbst. Eine gewisse geistige Haltung, vielleicht unter dem starken Einfluss religiöser Momente, kann trotz starken Volkswachstums ein grosses Hindernis für den wirtschaftlichen Fortschritt sein. Der schwerlastende Gedanke an das Jenseits kann die wirtschaftliche Tatkraft und Energie des Menschen stark beeinträchtigen. Auch die rein äusseren Verhältnisse, wie der grosse Naturreichtum schwüler, tropischer Gebiete wirken erschlaffend auf die wirtschaftliche Tätigkeit eines Volkes. Die geographischen Verhältnisse und die Verhältnisse der sonstigen Umwelt können eben einen fördernden oder hemmenden Einfluss auf die menschliche Willenskraft ausüben und damit dem Faktor Mensch und Arbeitskraft für den Gang der Wirtschaft eine ganz verschiedene Bedeutung geben. Es sind also jedenfalls innere und äussere Voraussetzungen erforderlich, damit ein starkes Volkswachstum als vorwärtstreibender Faktor den Gang der Wirtschaft beeinflussen kann.

Man darf also keinesfalls ganz allgemein das Volkswachstum schlechthin als die Ursache des wirtschaftlichen Fortschrittes bezeichnen. Wohlt trifft das vielleicht für Völker und Stämme auf einfacheren Stufen zu. Wie die Geschichte zeigt, war es vielfach zuerst, wenn auch keineswegs überall, die einfache, durch die steigende Volkszahl hervorgerufene Not, die vielfach das wirtschaftliche Leben der Menschen von Grund aus umgestaltete. Schon die Sesshaftigkeit und der Beginn eines geregelten Ackerbaues und auf höheren Stufen die Entwicklung von Gewerbe und Handel, hängen ursächlich auf das engste mit dem Volkswachstum zusammen. Aber alle diese Wandlungen konnten sich nur vollziehen, wenn jene oben genannten inneren und äusseren Voraussetzungen vorhanden waren.

Wo diese Voraussetzungen fehlten, wo z.B. das Land einfach nicht die Möglichkeiten bot, zu einem ergiebigeren Ackerbau überzugehen oder wo auf einer späteren Stufe einem Lande die Voraussetzungen fehlten, um auf dem Wege des Aussenhandels die Nahrungsstoffe aus fremden Ländern einzutauschen, die der eigene Boden nicht gewähren konnte, dort konnte auch eine noch so grosse Steigerung der Volkszahl nicht den wirtschaftlichen Fortschritt erzwingen, der notwendig war, um die Menschen in der eigenen Heimat zu ernähren. Für das Gesagte gibt die Geschichte bis zur Gegenwart zahlreiche Beispiele.

Wir sehen also, dass keineswegs überall eine Steigerung der Volkszahl die gleichen wirtschaftlichen Erscheinungen hervorgerufen hat. Wir können deshalb auch jene nicht rein mechanisch als Ursache der wirtschaftlichen Entwicklung und des wirtschaftlichen Fortschrittes betrachten.

Die Verhältnisse zwischen Bevölkerung und Wirtschaft sind vielmehr—gerade unter diesem Gesichtspunkte gesehen—wesentlich komplizierter. Zwischen der Entwicklung beider ist kein einfacher Kausalzusammenhang vorhanden. Es handelt sich vielmehr um Wechselbeziehungen. Wohl wirkt die Volkszahl und damit auch die Stärke des Volkswachstums mit als verursachender Faktor für den Gang der Wirtschaft. Aber auch umgekehrt sind die Gegebenheiten der Wirtschaft auf allen ihren Stufen eine ganz wesentliche Voraussetzung dafür, dass ein Land eine bestimmte Volkszahl ernähren kann. Nur, wenn diese wirtschaftlichen Voraussetzungen es zulassen, kann die Volkszahl immer mehr ansteigen. Geht man von diesen Wechselbeziehungen aus, und zieht man in Betracht, dass also neben dem Volkswachstums noch andere, nicht weniger wesentliche Faktoren für den wirtschaftlichen Fortschritt mitbestimmend sind, so wird man das Volkswachstum nicht als verursachenden, sondern nur als bedingenden Faktor für den Gang der Wirtschaft bezeichnen dürfen.

Hier ist dann die sog. Ursache nichts anderes als die Bedingung, die erforderlich ist, damit eine andere Erscheinung eintreten kann. Ob sie dann auch wirklich eintritt, hängt auch noch von anderen Faktoren ab. Man kann deshalb auch diese Beziehungen zwischen Volkszahl und wirtschaftlicher Entwicklung als funktionale bezeichnen, weil ihr Zusammenhang doppelseitig ist. In der ganzen Reihe von Ursachen und Wirkungen, die dabei auftreten, ist die eine von der anderen abhängig. In der ganzen Entwicklung ist ein immer verbindender Zusammenhang aller

Glieder vorhanden. Beides, Volkszahl und Wirtschaft, bedingen sich gegenseitig. Die Entwicklung der einen Grösse nach einer bestimmten Richtung hin ist unmöglich, wenn nicht die andere auch einen ganz bestimmten Gang nimmt. Eine bestimmte Dichte der Bevölkerung ist an eine bestimmte Stufe der wirtschaftlichen Entwicklung gebunden und das Vorhandensein dieser letzteren hängt dann auch wieder in hohem Grade damit zusammen, dass diese Volksdichte ein bestimmtes Mindestmass erreicht hat.

Nur da, wo jene anderen in den Menschen und in der wirtschaftlichen Umwelt liegenden Voraussetzungen vorhanden waren, dort hat dann die steigende Volkszahl als mächtiger Hebel alles wirtschaftlichen Fortschrittes wirken und jene Stufe der Wirtschaft herbeiführen können, wie wir sie vor allem in den europäischen Kulturstaaten antreffen.

Allerdings zeigt nun vornehmlich in neuerer Zeit die Entwicklung bei vielen Völkern, in erster Linie in den Kulturstaaten, dass die Leistungsfähigkeit der Wirtschaft wesentlich stärker gestiegen ist als die Volkszahl. Eine Steigerung von Wohlstand und Lebenshaltung wäre auch auf keinem anderen Wege möglich gewesen. Schon allein diese Tatsache, dass bei so vielen Völkern die wirtschaftliche Entwicklung in so starkem Masse dem Volkswachstum vorausgeeilt ist, zeigt, dass diesem letzteren doch nicht die massgebende Rolle für den wirtschaftlichen Fortschritt zukommt, wie man schon mitunter angenommen hat.

Die Wege, die es möglich gemacht haben, dass die Erträge der Wirtschaft bei zahlreichen Völkern in neuerer Zeit so viel stärker anstiegen als die Volkszahl, waren so mannigfaltig, dass sie in diesem Zusammenhang nicht genauer erörtert werden können. Nur einiges Allgemeinere und Wesentlichere sei an dieser Stelle hervorgehoben.

In älteren Zeiten, noch bis in die Mitte des 19. Jahrhunderts, war bei den europäischen Völkern das Wachstum recht langsam. Es hing dies mit der grossen Sterblichkeit in früheren Jahrhunderten als Folge von Kriegen, Hungersnöten und Epidemien zusammen. Man wird auch für die Zeit des Mittelalters und die ersten Jahrhunderte der Neuzeit kaum davon sprechen können, dass die Erträgnisse der Wirtschaft in stärkerem Masse dem Volkswachstum vorausgeeilt wären. Das war mitunter vorübergehend der Fall, auch Malthus hat davon gesprochen. Für einige Jahre oder Jahrzehnte trat vielleicht das ein, um dann immer wieder durch starke Rückschläge unterbrochen zu werden. In der langen Linie gesehen, wird man aber von einer solch durchgehenden Aufwärtsentwicklung der Wirtschaft in jener älteren Zeit kaum sprechen können, vor allem dann nicht, wenn man die Entwicklung seit der zweiten Hälfte des 19. Jahrhunderts zum Vergleich heranzieht.

Ganz anders war jedoch die Entwicklung von Volkszahl und Wirtschaft in den Kulturstaaten, etwa von der zweiten Hälfte des vorigen Jahrhunderts ab. Hierfür kamen einmal die grossen Errungenschaften der Technik und Naturwissenschaften in Frage, nicht nur auf dem Gebiete des Pflanzenbaues, sondern auch auf demjenigen des Verkehrswesens und der gewerblichen Tätigkeit. Die Fortschritte bei der letzteren haben sich dann auch in hohem Masse zugunsten der Erträge in der Landwirtschaft geltend gemacht. Dazu kam im engsten Zusammenhang mit den Fortschritten im Verkehrswesen, die Neuerschliessung grosser Agrar-und Rohstoffgebiete in Uebersee.

Mit dem Gesagten sind jedoch die Ursachen der gewaltigen wirtschaftlichen Fortschritte in den letzten Menschenaltern nicht erschöpft. Wenn die Technik bei uns in wenigen Jahrzehnten mehr neue und wesentlich grössere Erfolge gebracht hat, als zuvor in vielen Jahrhunderten, so hängt dies vor allem auch damit zusammen, dass in älteren Zeiten der Erfinder misstrauisch als ein etwas merkwürdiger Mensch angesehen wurde, dass die Erfindung mehr Sache des Zufalls war, während er heute auf vielen Gebieten, man denke nur an die Chemie, sich zu einem bestimmten Berufe ausgebildet hat.

Es kommt noch hinzu, dass sich in der Gegenwart der technische und wirtschaftliche Fortschritt sehr schnell von einem Lande auf das andere überträgt und zwar auch auf Länder, in denen aus einem Bevölkerungsdruck heraus solche Fortschritte gar nicht erforderlich gewesen waren. Wo solchen Ländern dann zur Durchführung von Verbesserungen und Erfindungern das erforderliche Kapital fehlte, da strömte es aus den europäischen Staaten herbei, un diese Lücke auszufüllen.

Man mag die Tüchtigkeit und geschäftliche Energie der Amerikaner noch so hoch einschätzen, die Vereinigten Staaten hätten in solch kurzer Zeit die wirtschaftliche Stufe, auf der sie sich heute befinden, niemals erreichen können, wenn ihnen zur Entwicklung ihrer Wirtschaft und zum Ausbau ihres Landes nicht das an Erfindungen und an Kapital zur Verfügung gestanden hätte, an deren Schaffung zuvor viele Generationen von Europäern gearbeitet haben. Gerade bei den Vereinigten Staaten kann man auf das deutlichste beobachten, dass sich hier ein gewaltiger technischer und wirtschaftlicher Fortschritt vollzogen hat, dass die Erträgnisse der Wirtschaft weit stärker als die Volkszahl gestiegen sind, ohne dass eine steigende Volkszahl selbst als vorwärtsdrängender Faktor dahinter gestanden hätte. Für zahlreiche andere Ueberseegebiete ist heute bereits deutlich erkennbar die gleiche Entwicklung zu beobachten oder bestimmt noch zu erwarten.

Wenn man all dies in Betracht zieht, so kommt man zu dem Ergebnis, dass heute, vor allem für die Kulturstaaten, der Bevölkerungsdruck als wirtschaftsfördernder Faktor keine oder nur noch eine sehr geringe Rolle spielt. Das mag für ältere Zeiten der Fall gewesen sein, mag auch heute noch unter bestimmten Voraussetzungen für Völker auf primitiveren wirtschaftlichen Stufen gelten. Für die Gegenwart ist aber bei den Kulturvölkern diese Rolle des Volkswachstums als Triebkraft für den wirtschaftlichen Fortschritt wohl zu Ende. Sie tritt mindestens immer mehr hinter der Wirksamkeit anderer Faktoren zurück.

Nur in einer Hinsicht wird man vielleicht auch heute noch einen solchen Zusammenhang, wenn auch in ganz anderem Sinne als in älteren Zeiten feststellen können, wobei jedoch nicht erörtert werden soll, welche Tragweite diesem Zusammenhang zukommt. Es können dafür an dieser Stelle nur die ganz groben Tendenzen angegeben werden.

Wenn in einem Lande die Volkszahl regelmässig an Stärke zunimmt, dann steigt die Nachfrage auf dem Gütermarkte, wenn der Volkszuwachs in das arbeitsfähige Alter hineinkommt und die komplementären Produktionsgüter vorhanden sind, dass sich diese zusätzliche Arbeitskraft mit Erfolg betätigen kann. Da in der langen Linie gesehen Boden und Rohstoffe nur zu steigenden Kosten zur Verfügung stehen, so wird bei steigender Volkszahl mit einer Tendenz zu einer Erhöhung der Preise zu rechnen sein. In dem Masse, in dem sie in die Höhe gehen, werden Mehraufwendungen von Kapital und Arbeit, bei denen dies zuvor infolge des Gesetzes der steigenden Kosten nicht der Fall war, rentabler und damit wirtschaftlich durchführbar. Wenn aber dann der Bodenanbau und die Gewinnung von Rohstoffen intensiver betrieben werden, so werden damit mehr Maschinen, Kunstdünger u.s.w. zur Anwendung gelangen. Die Nachfrage nach diesen Erzeugnissen der Industrie wird steigen. Hierdurch entstehen Kräfte, die hier wieder in der Richtung einer Senkung der Kosten wirksam werden können. Diese Kräfte können mehr oder weniger im Stande sein, die gestiegenen Kosten bei der Bodenbenützung auszugleichen. In dieser Weise etwa können durch das Volkswachstum Kräfte ausgelöst werden, die technische Möglichkeiten wirtschaftlich durchführbar machen, bei denen das zuvor nicht möglich war. In diesem Sinne könnte heute noch das Volkswachstum, natürlich nur innerhalb bestimmter Grenzen, den wirtschaftlichen Fortschritt fördern helfen.

Man darf also nicht übersehen, dass aus der Vermehrung der Volkszahl, wenn der Nachwuchs in das arbeitsfähige Alter kommt und die komplementären Produktionsmittel ohne steigende Kosten zur Verfügung stehen, eine Steigerung der Güternachfrage hervorgehen und dadurch der wirtschaftliche Fortschritt gefördert werden kann. Demgegenüber muss aber doch hervorgehoben werden, dass gerade auf der heutigen Stufe der wirtschaftlichen Entwicklung in dem zahlenmässigen Wachstum der Bevölkerung keinewegs mehr der stärkste Faktor liegt, der eine Vermehrung der Güternachfrage zu bewirken vermag. Denn die gleichen Wirkungen können heute auch ohne Steigerung der Volkszahl noch auf andere Weise erreicht werden. Gerade an diesem Punkte zeigt sich vielleicht in stärkster Weise der Gegensatz innerhalb der Beziehungen von Wirtschaft und Bevölkerung in älterer und neuerer Zeit.

Die Nachfrage auf dem Gütermarkte wird nämlich nicht durch die Volkszahl, sondern durch die Kaufkraft der Bevölkerung bestimmt. Diese Kaufkraft kann—wie eben hervorgehoben wurde—steigen, wenn der Nachwuchs der Bevölkerung in das arbeitsfähige Alter gelangt und wenn diese zusätzliche Arbeitsleistung ohne steigende Kosten vor sich gehen kann. Die Kaufkraft einer Bevölkerung hängt jedoch nicht von ihrer Zahl, auch nicht von der Zahl der im arbeitsfähigen Alter Stehenden ab; es gibt auf der Erde sehr volkreiche und dichtbesiedelte Gebiete mit einer sehr geringen Kaufkraft und solche, die viel weniger dicht besiedelt sind mit einer sehr viel grösseren Kaufkraft.

Die Grösse der Kaufkraft hängt von nichts anderem ab, als von den Ergebnissen der Produktion. Diese Ergebnisse haben jedoch heute nicht mehr den gleichen engen Zusammenhang mit der Stärke des Volkswachstums, wie in älteren Zeiten. Man wird freilich einwenden, dass auch heute noch zwischen diesen

Ergebnissen der Produktion und der Volksdichte und damit der Stärke des Volkswachstums ein gewisser Zusammenhang besteht. Nur dort nämlich, wo genügend Menschen vorhanden sind, sei es möglich, die in einem Lande schlummernden Kräfte wirtschaftlich auszunutzen. Sind doch auch die Fortschritte der Technik wirtschaftlich in der Regel nur dann anwendbar, wenn eine Massenproduktion, die ohne Massenabsatz nicht möglich ist, stattfinden kann.

Dieser Gedankengang ist durchaus zutreffend. Aber in diesem Sinne wirkt die Steigerung der Volkszahl nicht unmittelbar im Sinne eines wirtschaftlichen Fortschrittes, sondern nur deshalb, weil sie unter den genannten Voraussetzungen die in einem Lande vorhandene Kaufkraft und damit die Nachfrage auf dem Gütermarkte verstärkt. Die gleiche Wirkung kann aber auch ohne Wachstum der Bevölkerung eintreten. Wir sehen auch tatsächlich, dass in neuerer Zeit die Kaufkraft in den Kulturstaaten viel stärker gestiegen ist als die Volkszahl. Wie wenig darauf die Zunahme der Bevölkerung heute von Einfluss zu sein braucht, zeigt das Beispiel Frankreichs, dessen Bevölkerung seit Jahrzehnten nur in recht geringem Umfange zugenommen hat.

Es wurde schon betont, dass die Kaufkraft eines Landes, wenn man von Zahlungen und sonstigen Leistungen aus fremden Ländern absieht, nichts anderes ist, als das wirtschaftliche Erbegnis der Produktion und dass wir demgemäss in der Kaufkraft nur einen anderen Ausdruck für die Grösse des Volkseinkommens zu erblicken haben. In diesem haben wir es dann mit gewissen, wenn auch nicht sehr wesentlichen Einschränkungen, mit einer Grösse zu tun, die mit derjenigen des Nahrungsspielraumes eines Landes gleichbedeutend ist. Wir sehen jedenfalls, ob wir nun für die Entwicklung der Wirtschaft von der Gestaltung der Kaufkraft, des Volkseinkommens oder des Nahrungsspielraumes sprechen, dass diese Entwicklung immer unabhängiger von dem Gang und der Stärke des Volkswachstums geworden ist.

Wenn wir fragen, weshalb das der Fall war, so ist die Antwort nicht schwer zu finden. Sieht man von der bereits erwähnten Tatsache ab, wie schnell und leicht in neuerer Zeit alle Fortschritte und Verbesserungen von einem Lande auf das andere übertragen werden, so kann man, darüber hinausgehend, noch sagen, dass sich alle diese Fortschritte und Verbesserungen der Gegenwart in ganz anderer Weise, auf einer ganz anderen Ebene fast, vollziehen als in älteren Zeiten. Ein Blick in den Gang der neueren wirtschaftlichen und technischen Entwicklung zeigt auf das deutlichste, dass hierbei ganz andere Faktoren als Triebkräfte mitgewirkt haben, als ein Druck, der sich aus dem Volkswachstum ergab.

Alle diese Fortschritte und Verbesserungen vollziehen sich vielmehr seit Jahrzehnten in steigendem Masse in immer mehr überlegter und bewusster Weise, ohne dass ein solch äusserer Druck dahinter stände. Schon allein die Konkurrenz, die Abhängigkeit vom Markte, das Streben nach Rentabilität, alles Erscheinungen, die ältere Zeiten überhaupt nicht oder nur in geringerem Masse gekannt haben, sind heute ganz unabhängig von jedem Volkswachstum zu starken Hebeln allen wirtschaftlichen Fortschrittes geworden. Der ganze grosse Rationalisierungsprozess, der nach dem Weltkriege in so starkem Masse einsetzte, steht in keinerlei Beziehung zu dem Wachstum der Bevölkerung. Dieser hier kurz skizzierten Entwicklung haben wir es zu verdanken, wenn in so vielen Ländern die Ergiebigkeit der Wirtschaft so viel stärker zunahm als die Volkszahl. Man darf wohl mit Bestimmtheit sagen, dass auch in Zukunft solche Kräfte in ähnlicher Weise wirksam sein werden.

Mit solchen Uberlegungen kommt man auch an die neuerdings häufig erörterte Frage, wie es denn mit dem wirtschaftlichen Fortschritt bestellt sein wird, wenn in Westeuropa und in manchen anderen Kulturstaaten das Volkswachstum eines Tages zu Ende sein und vielleicht einem Rückgang der Volkszahl Platz machen wird.

Der amerikanische Soziologe E. A. Ross hat in seinem Buche *Standing Room Only* (New York, 1927), diese Frage erörtert und die Meinung vertreten, dass an Stelle des früheren Bevölkerungsdruckes in neuerer Zeit der Bedürfnisdruck getreten sei und dass dieser auch in Zukunft die Funktionen ausüben werde, die früher durch den Bevölkerungsdruck ausgeübt worden waren. Die Wünsche, das Streben der Menschen, werden seiner Meinung nach stark genug sein, um auch bei einem Stillstand oder einer Abnahme der Volkszahl den wirtschaftlichen und technischen Fortschritt nicht zum Stillstand gelangen zu lassen.

In diesem Gedanken liegt sicherlich eine durchaus zutreffende Beobachtung. Aber darüber hinaus werden auch die oben genannten Faktoren, die auch z.T. mit den von Ross geäusserten Gedanken zusammen hangen, schon stark genug sein, um auch bei einem Stillstand des Volkswachstums oder gar bei einer

Abnahme der Volkszahl den wirtschaftlichen und technischen Fortschritt nicht zur Ruhe kommen zu lassen.

Mag man vielleicht aus anderen Gründen in einem Aufhören des Volkswachstums keine erfreuliche Erscheinung sehen, für den Fortgang der Wirtschaft werden daraus jedenfalls keine Gefahren erwachsen. Es wird das umso weniger der Fall sein, als gerade ein Rückgang in der Stärke des Volkswachstums die Kapitalbildung günstig beeinflussen wird. Eine auf diese Weise herbeigeführte Verbilligung der Kapitalnutzung wird aber manche technischen Fortschritte ökonomisch durchführbar machen, bei denen dies bei einem höheren Zinsfuss nicht der Fall gewesen wäre. Damit sind auch in stärkerem Masse die ökonomischen Voraussetzungen zu einer Kapitalsubstitution gegeben, wenn bei Abnahme des Volkswachstums Tendenzen zu einer Lohnsteigerung entstehen sollten. Auch ein Mangel an Arbeitskraft wäre deshalb kaum zu befürchten und als Hemmnis eines weiteren Fortschreitens der Wirtschaft zu betrachten.

Es besteht also kein Grund zu der Annahme, dass in den europäischen Kulturstaaten bei einem Aufhören des Volkswachstums nicht die Kaufkraft der Bevölkerung weiter ansteigen und der Fortschritt der Wirtschaft damit weitergehen sollte.

Field (James Alfred). *Essays on Population.* U.S.A.: University of Chicago Press; Great Britain and Ireland: Cambridge University Press. Pp. 440. Price 16s.

The volume under review consists of the collected papers of the late Professor Field, of the Department of Economics of Chicago University. The essays are edited and a short biography is written by Miss H. J. Hohman, and Dr. James Bonar contributes an appreciative foreword. The book is divided into two parts, of which Part I, much the larger section, deals with different aspects of the population question. The form of the book entails a good deal of overlapping and repetition, but there is much in it which will interest all students of population problems, particularly on the historical side. The first essay, hitherto unpublished, "The Malthusian Controversy in England," appears to have been originally prepared as a thesis, and is justly characterized by Dr. Bonar as one of the most comprehensive historical surveys ever published of this involved and voluminous dispute. It dissects in turn each one of the contributions to the controversy, and shows clearly how it, like other disputes, was darkened by wrangles about the meanings of words. The author also deals clearly and fully with the vexed question as to whether the famous geometrical and arithmetical progressions were foundation-stones of the Malthusian position or mere illustrative trimmings.

Essay III, "The Early Propagandist Movement in English Population Theory," is an article which has long been out of print and is certainly worthy of a wider publicity. It gives the forgotten story of a vigorous birth-control propaganda movement in England in the 1820's. The actual propagandists naturally avoided publicity, but it appears certain that Place was concerned, and the connection with the Benthamite school is clear. The alleged participation of Robert Owen seems much more doubtful. The campaign was a vigorous one, and the Radical Carlile describes the informative handbills as circulating in thousands throughout the populous districts of the North. But the movement made no appreciable progress and died away after a few years. It is curiously linked with the movement of the 'seventies. Owen's son, Robert Dale Owen, who emigrated to the States, published in New York in 1830 *Moral Physiology*, which embodied his views of the English movement and its publications. This work seems to have prompted Dr. Knowlton's *Fruits of Philosophy*, published in 1833 in Boston. It was a re-publication of the *Fruits of Philosophy* which was the subject of the famous Bradlaugh and Besant trial in 1877. This trial, by general consent, advertised the birth-control movement, and indeed launched it upon its modern career. It was a very different movement from the campaign of the 'twenties, which was directed towards the working classes by an intelligentsia inspired by the Malthusian viewpoint. It fell on the stony ground of ignorance, prejudice, and a fatalistic acceptance of poverty. The knowledge gained in the 'seventies was at first confined to the educated classes and was used by them from personal motives.

The two essays mentioned are the most substantial on the historical side; they are supplemented by a further essay on Malthus and an account of the establishment of the study of eugenics. In the former essay an editorial slip has allowed a statement as to Pitt and the Poor Law which read curiously (p. 268).

The remaining essays in Part I deal with current problems of population, mainly those arising in connection with birth-control. The author shows trenchantly that all attempts at the suppression of the new knowledge have simply resulted in its further extension. It is inevitably part of our modern civilization, and as such is fraught with tremendous potentialities both for good and evil. The necessity for calm, unprejudiced study is stressed, and all who read these essays will regret that fate has willed that the author's own keen, unbiased mind will make no further contribution to the discussion of population problems.

The list of books and pamphlets on Population in Professor Field's library should be mentioned as forming a useful bibliography of the subjects dealt with in the essays.

M. C. BUER.

UNION INTERNATIONALE POUR L'ÉTUDE SCIENTIFIQUE DES PROBLÈMES DE LA POPULATION. COMITÉ BELGE. *Enquête sur les conditions de vie des familles nombreuses en Belgique*. Liège: Georges Thone, Éditeur. 1933.

This inquiry was initiated by the Belgian Committee of the International Union for the Scientific Investigation of Population Problems, and carried out mainly by voluntary agency. The results are analysed by Mlle. Aimée Racine, a preface is contributed by M. Mahaim, and there is a chapter on "Conclusions Sociologiques," by M. E. Dupréel.

The intention of the inquiry was to discover whether families containing five or more children had any special characteristics, either in origin, environment, occupation, or habits which differentiated them from other families. Since the method was to obtain information from families which the investigators could get into contact with, and not to select them on any principle which would show their numerical relation to other families, or in fact that could lead to any generalizations about large families themselves, the result has been to provide a series of 140 intimate and interesting descriptions from the economic and sociological standpoints. M. Mahaim describes the result very accurately: "Voici donc, en résumé, ce que nous apportons: une série de petits tableaux, pris dans la vie même des familles. Nous leur avons demandé des précisions, des indications sur leur genre de vie, des confidences aussi, dans une certaine mesure, sur leurs convictions. Mettons ensemble les réponses variées qui nous ont été faites, nous tentons de mettre en relief les traits principaux du caractère et de vie de ces familles."

M. Dupréel's analysis is interesting but inconclusive. He finds, indeed, that in a considerable number of cases where the parents are proud of the size of their families: "Ses membres ont la conscience d'appartenir à une catégorie socialement et moralement supérieure, et ils le sont en effet, par leurs qualités et leur activité." This group he distinguishes from another where "le grand nombre des enfants n'est qu'une conséquence naturelle qu'on subit avec plus ou moins de résignation." Without any means of placing these two groups in numerical relation to each other or to the general population, we cannot regard this analysis as of much significance.

Nevertheless the investigation is important as opening up a new field of inquiry, and showing that intimate details of family life and of ideals can be learnt by patient inquiry. It also provides interesting reading and is very suggestive of interesting sociological problems.

A. L. BOWLEY.

WATTAL, P. K. *The Population Problem in India.* Bennett, Coleman, Calcutta, London. 1934. Pp. 185. Price Rs. 3/8.

Mr. Wattal was one of the first Indian economists to emphasize the vital importance of the population problem in India, having published his *Population Problem in India* in 1916. He has now completely rewritten and enlarged the scope of his book, so that the second edition is, as he himself says, "more a new book than a revised edition."

His work is essentially a summary of and commentary upon the Indian Census of 1931, the main topics being marriage, births and deaths, differential fertility, migration, the pressure of the population on the means of subsistence, and birth control. The author presents the relevant figures, including those from previous censuses and some from other countries, in a concise and useful form, bringing out clearly the main social and economic problems upon which the Census sheds light. The result is a valuable social document, worthy the attention of all who are interested in the future of India.

Mr. Wattal writes throughout as a social reformer and an economist rather than as a statistician. He does not attempt any profound analysis or novel comparative interpretation of the figures. Much work remains to be done on the Indian statistics, particularly as some of them yield results that are surprising when compared with those of other countries. It is, however, uncertain, in view of the acknowledged inaccuracy of the records, whether the time has yet come for such an analysis. For instance, Mr. Wattal (p. 38) reproduces a "fertility table" giving the average size of family (showing the number of children born alive and surviving) correlated with the age of the wife at marriage. From this it appears that girls married at ages below twenty give birth to a smaller number of children than those married at ages above twenty, and that the survival-rate of children born to the younger mothers is less than that of children born to older mothers. Where the wife is married at thirty years or over, both the average size of the family and the survival-rate are highest of all. In other countries directly opposed results are obtained. Dr. Enid Charles* says (of the Swedish figures) that "the fertility of married women is greatest in the group aged fifteen to nineteen, and falls steadily throughout the period. These two statements are true of all populations for which statistics are available." Mr. Carr-Saunders has also stated that the postponement of marriage reduces fecundity. It would be interesting and important to know whether this peculiarity of the Indian figures is to be attributed to inaccuracy, or whether special factors are at work in India affecting fertility and survival. Mr. Wattal does not comment on the peculiarity of the figures, but he does express a fear that raising the age of marriage and child-bearing in India may tend to increase fertility, and thus to aggravate the tendency towards over-population. It is to be hoped that the Government of India will before long adopt improved methods of collecting and recording such statistical data, and thus provide a sound basis for comparative studies.

In the meantime it may be suggested that Mr. Wattal does not emphasize sufficiently the unreliability of some of the Indian data, although he does refer to it. For instance, he quotes a death-rate of sixteen per thousand for Travancore as an ideal to which India as a whole might reasonably be expected to attain. The Census Commissioner for Travancore, on the other hand, lays great stress on the inaccuracy of the vital statistics, and also on the under-numeration of the 1921 Census for Travancore, whilst (incidentally) he makes a revised estimate of twenty per thousand for the annual death-rate during the last inter-censal decade. In fact, the Commissioner states that "in Travancore, owing to the absence of correct vital statistics, it is not possible to say in what proportion the death-rate is decreasing, if at all" (p. 47), and calls attention to the great disparity between the statistics collected in Travancore by the Registrars and by the Public Health Department. In certain districts where special inquiries were carried out by the latter, the omissions by the registrars amounted to no less than 59 per cent. for births and 50 per cent. for deaths! The Commissioner concludes that "in the absence of reliable data bearing on all these points, it is not possible to say whether rising fertility or falling mortality is responsible for the variation in the rate of growth of the population" (p. 35). Where the margin of error is so enormous, it is obviously impossible to draw any conclusions as to the trend of birth- and death-rates, but Mr. Wattal does not impress this fact on the reader. He also draws entirely unwarranted conclusions about changes in the proportion of the population dependent upon agriculture. It is well known that owing to changes in classification, etc., the occupational figures of the censuses before and after 1911 cannot be directly compared. Yet Mr. Wattal takes the census figures, without making any estimates for such changes in classification (except as between the censuses of 1921 and 1931), and alleges that dependence upon agriculture has greatly increased. It is possible that dependence upon agriculture has increased, but the alleged extent of that increase is quite unjustified.

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* *Twilight of Parenthood,* p. 58.

With Mr. Wattal's general conclusions, however, there is little reason to quarrel. All the facts and figures testify to the fundamental importance of the population problem to India, to the close connection between vital social problems (such as child-marriage, restrictions on widow re-marriage, lack of education, and the poor state of public health) and the growth of population, and to the wide prevalence and deplorable social results of certain Indian customs and institutions, especially those connected with marriage and the status of women. It cannot be denied that India is still at a stage characterized by extremely high birth-, death-, infant mortality-, and maternal mortality-rates. The expectation of life in India is less than half that for England. Here the figures for different communities are of particular interest; for instance, those for the Parsis, whose birth- and death-rates are more like those of European countries than of other Indian communities. Here is strong evidence for the influence of social institutions and economic circumstances, as contrasted with climatic and other environmental factors, on birth- and death-rates.

Mr. Wattal's main conclusion, to which he makes incidental references throughout, and in addition devotes a special chapter, is the urgent need for birth-control, in the absence of which he sees little hope of any improvement in the standard of life of the masses. His chapter on migration merely emphasizes the well known and widely recognized fact that no appreciable contribution to the solution of the problem of over-population in India can be expected from either emigration to foreign countries or from internal migration to, for instance, Assam or Burma. The prospects of what has hitherto been classed as "internal" migration have indeed been worsened by the probability of the separation of Burma, which may give rise to the imposition of restrictions on the entry of Indian labourers.

One final word may be said about the fear, which Mr. Wattal at least faces squarely, that social reforms—such as improvements in public health and the care of children, raising the age of marriage and child-bearing, removal of the ban on the re-marriage of Hindu widows, and economic progress in general—may all tend to an increase in population, leaving the pressure of population on the means of subsistence unrelieved. Mr. Wattal takes a gloomy view of the situation, considering that the stimulus towards improvement can only come from the widespread adoption of birth-control. He goes so far as to conclude that "the Indian death-rate will be reduced only when the birth-rate is reduced, and not before," and that "fecundity is at the sacrifice of longevity, and that communities desirous of attaining longevity should as a preliminary measure reduce their birth-rate."* It has been suggested above that postponing the age of marriage may possibly not increase fertility, and it may be suggested further that in other countries a fall in the death-rate and an improvement in the standard of life have usually preceded a fall in the birth-rate. There seems no reason to suppose that the same order of events is not to be expected in India, although this is, of course, no argument against an agitation in favour of birth-control. Mr. Wattal's recommendations that a Commission should be appointed to inquire into the alarming growth of population in India, and that an "Indian Population Society" should be formed to study the whole subject scientifically, deserves warm support.

VERA ANSTEY.

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* Incidentally it may be suggested that here, as elsewhere, no distinction is drawn between "fecundity" and "fertility."

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CONTENTS OF NOVEMBER ISSUE, 1934

"Capital and the Heritage of Improvement" *Edwin Cannan*

"Carl Menger" *F. A. von Hayek*

"Measures of the Growth of British Industry" *Carl Snyder*

"Notes on the Pure Theory of Public Finance" *F. C. Benham*

"Recent Land Tenure Changes in Mid-Devon" *J. J. MacGregor*

"Mr. Harrod and the Expansion of Credit" *Dennis Robertson*

"A Rejoinder to Mr. Robertson" *R. F. Harrod*

Book Reviews by R. R. Kuczynski and others.

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